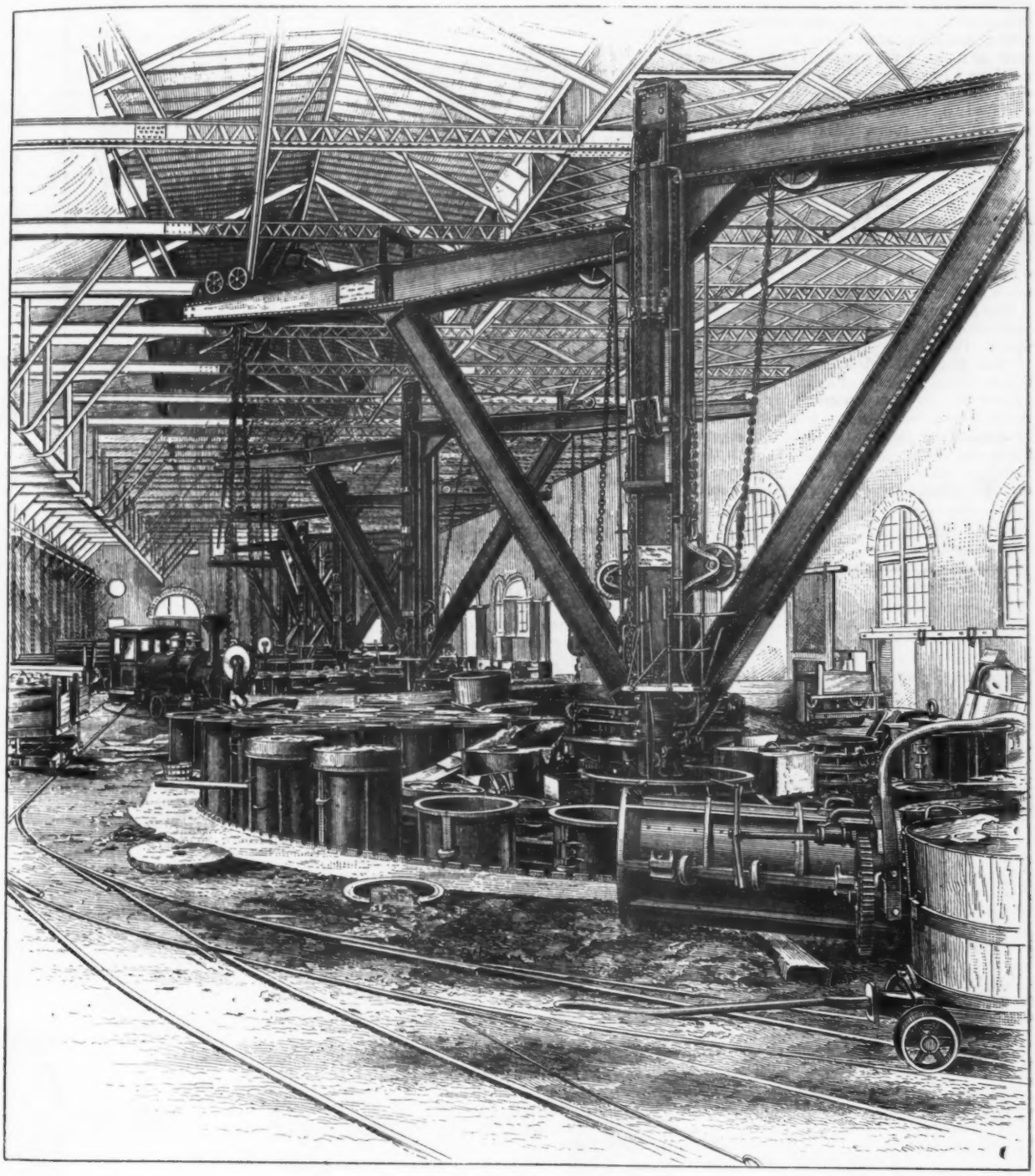
THE IRON AGE

THURSDAY, NOVEMBER 6, 1890.

MAKING CAST IRON PIPE.

It was recently the privilege of a representative of *The Iron Age* to pass through the works of the Addyston Pipe and Steel Company, located in Addyston, and surrounded by a beautiful country on the bank of the Ohio, about 12 miles out of Cincinnati, being within 300 yards of the river bank. The strip of land intervening between the river and the works is occupied by the tracks of the Ohio and Mississippi and the Cleveland, Cincinnati, Chicago and St. Louis railroads, with both of which the company are connected by their own private tracks, narrow gauge and standard gauge. An unusual interest attaches to this plant; first, for the reason that it is the most extensive establishment in the country devoted to the manufacture of cast iron pipe, and, second, because the methods pursued and machinery here employed may be considered as representing the highest perfection known in this industry, embracing the most modern improvements



PIPE FOUNDRY OF THE ADDYSTON PIPE & STEEL COMPANY.

While all work connected with the manufacture of cast iron pipe is extremely simple, each stage in the operation requires the exercise of extreme care, and the whole process may be considered as formed of links, upon each one of which the perfection of the finished product directly depends. In the pipe foundry one feature is quickly noticed, since it varies so decidedly from foundry practice as ordinarily known. In usual casting operations all movements, from the melting to the final pouring, are made deliberately. In this foundry the first thing noticed is the rapidity with which all hands are moved and the quick motion of all machinery. While this is not essential, yet

it is at the same time a fact, and one extremely pleasant to those who have been accustomed to slower methods.

THE FOUNDRY BUILDING.

An interior view of which is here presented, is 385 feet long by 120 feet wide, built entirely of stone in a most substantial manner, the walls being 2 feet 6 inches thick, with heavy buttresses; style of architecture Gothic. At one end of the building there are six cupolas, three of which are used each day. Along one side of the building are placed five pits, in the center of each of which are mounted two hydraulic cranes for handling the flasks, cores, &c.; each crane has independent hydraulic action with single acting hoisting rams; also single acting rack in and out movement to the trolley carriage which carries the hoisting chain and block The circular movement is operated by three independent single acting hydraulic rams. Extending longitudinally are two overhead 10-ton traveling cranes running the full length of the building. Down the center is an ordinary narrow guage track, locomotives being kept constantly employed in the building to deliver molten iron and other material to the pits. The core ovens, clay mixers, sifters and the like are arranged along the other side of the building.

The pit, in the center of which are two hydraulic cranes, is divided into three parts. One third consists of a pit about 10 feet below the floor level and which covers about one-half of a circle; the other half of the circle is occupied by gas furnaces, which serve to dry the molds, and by a ramming pit, into which the empty flasks are taken and re-rammed with the molding sand which forms the outside of the pipe. By following one mold through the several operations a fair idea of how the work is done may be had. For illustration we will take a mold in which the smaller size pipe are cast. The flasks, Fig. 2 and 3, which contain these molds are so arranged as to make two pipes at one time; they are hinged at one side, and in cross section are elliptical. In the usual method of working, the flasks are taken immediately after the former casting has been dumped out of them and set over into a ramming pit by a crane which is termed the "ramming crane," being set in a vertical position on the ramming stool placed in one section of the pit. In this stool, on which the flask rests, are two conical depressions which receive the end of the pattern used to form the mold, and which compresses the sand for the outside of the pipe. There are lugs on the ramming stool which fit exactly to the base of the flask to insure that each flask is perfectly central on the stool. The conical depressions into which the tube or pattern is inserted are used to insure the patterns being perfectly vertical and central in the flask; the lower portion of this pattern is of larger diameter than the upper part, as shown in Fig. 2; this is called the "butt" of the pattern, the upper part being called the "stem." The molding sand is thrown in about this butt and tightly rammed by the hand for a length equivalent to one-fifth of the full length of the pipe; the other four-fifths, which would comprise the stem of the pattern, is not rammed by the hand at all, the sand being loosely thrown in about the stem until level with the top part of the flask. The socket pattern is then forced down into the flask, being covered by a holding down plate, which is clamped to the top of the flask to hold the socket in position. The pattern is then drawn up by the hydraulic crane. The increased diameter of the butt A passing through the loose sand which lays around the stem compresses the same, and automatically makes a hard mold. Fig. 2 is a section of the flask with the pattern ready to pull. The holding down plate is then taken off, the socket pattern withdrawn and the mold, after being inspected with a lamp, is treated with a coat of blacking, after which it is set upon an oven to be thoroughly dried previous to making a casting in it. The drying is done by gas, a mixture of producer and water gas being used.

After the mold is thoroughly dried, which is usually done at night, it is lifted out of the drying oven by the casting crane, and set out in a pit in a vertical position, after which the crane is hooked on to a core carried on the adjacent core carriage, the same being lowered slowly down into the mold under the guidance of a man who sees that the right amount of any impurities which float on the top of the iron going into the gates and spoiling the pipe; at the same time he must not pour the molten liquid over the runner and waste it. The operation is all the more delicate on account of a heavy ladle being suspended on the hydraulic crane, the movements of which are controlled by another man. Fig. 3 shows section of called "gates," for the pouring of the metal, and being surmounted also by a band of iron which is used to form the "runner." After a series of these molds are set out with the cores centered, the molten iron is poured into them. Here the dexterity of the caster comes in; he must keep his runner filled so as to prevent

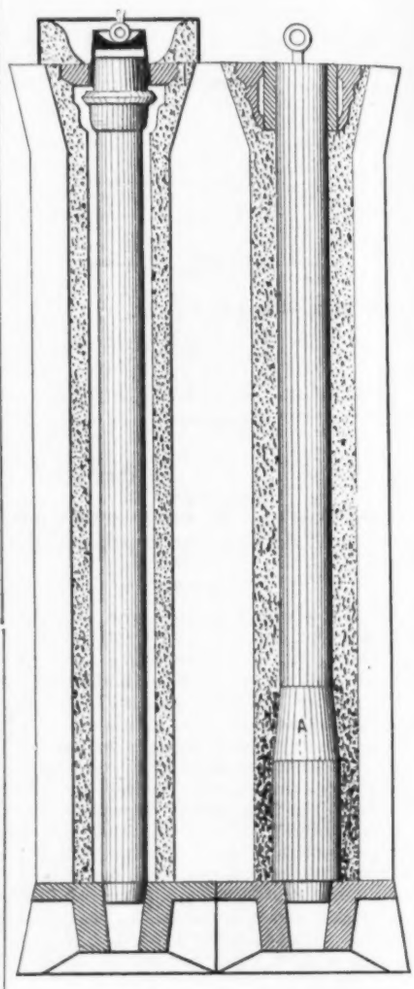


Fig. 3. Fig. 2.

Mold for Small Sized Pipe.

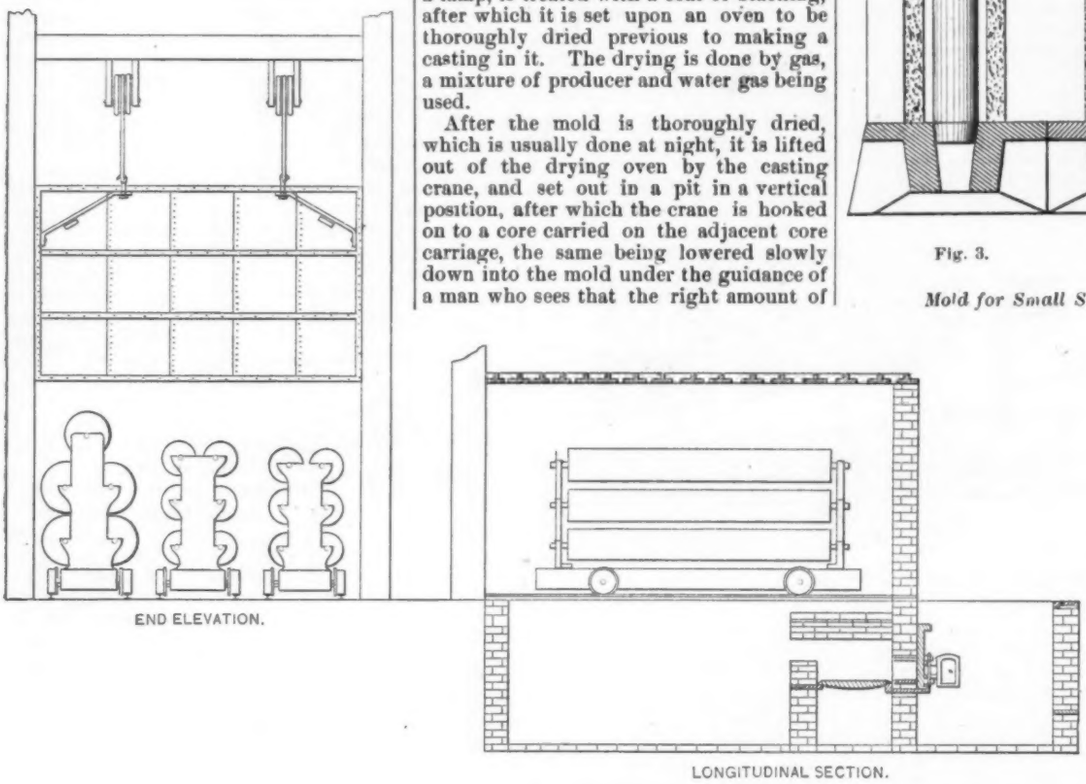


Fig. 4.—The Core Oven.

space is left between core and mold to form the thickness of pipe required. The core is held central by a chill plate clamped to the base of the flask as far as the bottom of the pipe is concerned. Into the top of the mold is inserted a clay ring, which holds the core central as far as the upper part of the mold is concerned, this ring having holes through it, commonly

mold with core inserted and "runner" made up all ready for pouring the iron.

After the casting has remained long enough to insure the iron being sufficiently cooled, the core bar is withdrawn, the flask then being lifted out of the pit and swung over a pair of skids whereon the pipe is dumped, the molding sand falling through the skids into a pit prepared for its reception below. The casting is then rolled outside of the foundry,

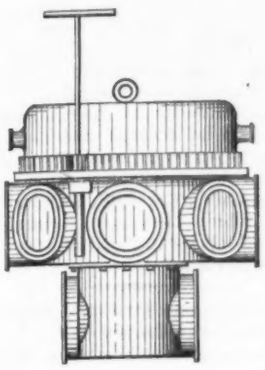


Fig. 5.—Twenty-Inch Center Valve Complete.

the skids being so arranged that gravity will convey the pipe on to a narrow gauge railroad buggy or car, which conveys the same to the cleaning and testing department.

THE CORE

referred to above is covered with hay and a preparation of loam, the operation being as follows: An iron tube with a series of holes drilled through it is set horizontally on a pair of trestles One end of this tube is prepared for the reception of a crank, which the core maker's helper inserts, revolves the tube, the movement being toward a board resting on the trestles. The core maker then applies a covering of hay (twisted into the form of a rope), which is covered with a coat of loam, called the first coat; the bar is then put in the drying oven. After the first coat is thoroughly dried and any hay protruding is broken off or covered, a second coat of a more open mixture is applied

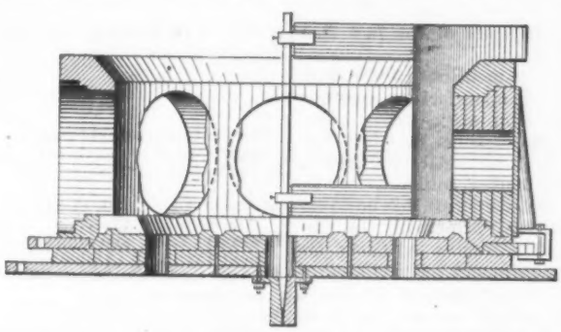


Fig. 6.—Cross Section through One of the Branches of Valve.

and allowed to dry. The core is again taken out of the oven and covered with a coat of blacking, which serves to prevent the molten liquid from burning into the clay and adhering to it, thereby causing the inside surface of the pipe to be rough, instead of perfectly smooth, as desired. When the molten metal surrounds this core in casting, the heat is sufficiently great to burn out the hay next to the tube and release the same. Fig. 4 shows a longitudinal section and end elevation of core oven.

The pipe passes from the foundry to the

TESTING DEPARTMENT.

The first that are cast each day are usually called "weigh" pipe; they are taken to a small skid and measured as regards diameter—external and internal—lead room, depth of socket, thickness of metal, and finally weighed, to see how near they are to the standard weight allowed. The slightest variation in the diameter of the core of even of a 6-inch pipe will make a material difference in its weight. If these pipes conform in all respects to the specifications to which they are made, the balance of the day's work is put up to the same templates the weighed pipe have been manufactured to. On the way to the testing department they are given a superficial examination, and if this reveals any fault they are immediately thrown to one side. Every pipe made is tested by hydraulic pressure to 300 pounds to the square inch, and while under strain is struck repeatedly and all over with a 1¼-pound hammer.

The testing operation and the machinery for doing it are extremely simple. The pipe is placed between two vertical heads, one of which is movable in a horizontal direction. Gaskets are provided at each end of the pipe. Hydraulic pressure being applied to the movable head forms a tight joint between the ends of the pipe and the heads. The rigid head is provided with a water inlet and outlet which strikes the center of the pipe. The water for the test is admitted by a valve, the pressure being run up to 300 pounds to the square inch, supplied by accumulators which serve as storage. A leak which could not be detected with the naked eye is immediately brought into prominence by the escaping water, and no matter how small and seemingly insignificant it may be, no attempt has ever been made to plug a pipe. A defect of any kind whatever causes the rejection of the pipe, which is then sent back to the foundry to be broken and remelted. The pipes are tarred, weighed, marked, and then delivered by the narrow guage railroad to the shipping yard, where they are stacked ready for delivery. In the testing rooms the pipes are handled by three hydraulic cranes.

A record is kept at each stage of the work, and each day a report is made of the number of pounds of good pipe made, number of pounds of defective, and the percentage of loss is ascertained. Then an inquiry is made to ascertain, if possible, the cause of failure. In case of defect in the molding, the work is reported against the pit turning the job out.

In a building near the shipping yard are placed the hay twisters, which are made by the company, and which daily handle and make into rope some 2½ tons of hay.

SUPPLIES.

The six cupolas located at one end of the building receive supplies from the yard alongside. All coal is brought down

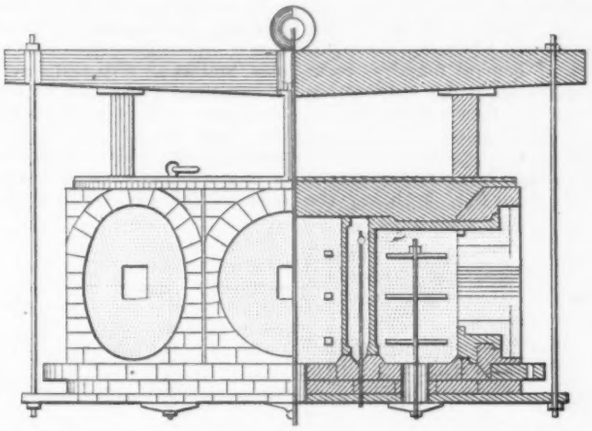


Fig. 7.—Part Elevation and Section of Mold Complete.

the river on barges, elevated up the bank of the river and then run over a track on a trestle work to the foundry. All pig iron is stacked in squares, so that it can be easily inspected and quickly got at, and so that one glance at the yard gives an idea of the quantity of each kind on hand. The mixture consists entirely of pig, except such scrap as arises incidentally from all castings and from condemned pipes, the known composition of the different irons giving the quality desired.

At one end of the cupola platform, located on the ground, is a steam crane consisting of a single acting cylinder, the piston of which is so arranged as to elevate the load. By means of this machine all iron is elevated to the loading platform connected with the cupola. The pig iron, when received, is marked on the end and then stacked as stated. Each charge of the cupola is marked according to the number of pounds of each grade or brand used, and a record is thus kept of the iron entering into that particular charge, and also a record kept of the result in the shape of the completed casting attained by the use of that particular mixture. At this end of the building is also the engine driving the traveling cranes, the sand screws, mixers and other machinery in the foundry. We may here add that all clay and sand are received down an inclined railroad from a pit on top of the hill about a half a mile away, which is the property of the company. The quality of material here obtained has been found to be perfectly adapted to the work, while it is so located as to be cheaply and easily delivered.

MACHINE SHOP AND GAS PLANT.

East of the foundry is a large building containing a 16 x 36 Hamilton-Corliss engine for driving the machinery in the machine shop, in which all repairing is done, and in which new machinery, flasks, specials, flange pipe and the like are made. This room contains also two Root blowers supplying blast for the special foundry. The machine shop is fully equipped with the

most improved lathes, planers, drills, &c. Adjacent to this is a Loomis water gas plant, which may be said to consist of the Loomis system as modified and improved by the company. There are six generators, the total capacity being 1,500,000 feet per day. There are two gas holders, one of 90,000 feet and one of 65,000 feet. This large supply of gas is needed, since it is used in every case where it could be possibly introduced

Adjoining the machine shop is the

SPECIALS FOUNDRY

or molding floor. This building is about 225 feet in length by 53 feet width proper, with a one story bay added to one side of it of about 28 feet, making the total floor space 225 by 81 feet.

In this building are manufactured all special castings, such as tees, crosses, branches, elbows and all curved forms, as also all classes of general foundry work. Principally noticeable, at the time of the visit of our representative, was the manufacture of a 20-inch center valve for gas works, which, when complete, would weigh 6000 pounds. We give sketches in illustration of this, Fig. 5 being the general view of the casting when set up complete; Fig. 6 gives cross section through one of the branches, showing the method of forming the mold, and Fig. 7 being part side elevation and part cross section of the mold set up complete with cores in. This is all loam work, sweeps and templates being used in place of solid patterns. The flask is bricked up, after completion of which the cores are set in, the whole being bolted down securely between heavy plates. The mold, all made up, is then set down into a pit in the floor, with heavy bearer bars top and bottom, the sand being all rammed tightly around the mold and a runner being constructed that serves for convenience in pouring.

We also noticed in process of manufacture a huge water cylinder, the weight of which was 20,000 pounds. This is a somewhat similar casting to the center valve, and is manufactured in about the same way, being swept up in loam.

The bay or one story part of the building, which is really an offset from the main floor space, is used for the manufacture of smaller specials. We give an illustration of a cross in Fig. 8, showing the mold made up ready for pouring. The bay is to the right. Traveling cranes control 60 feet width of floor space in the building proper; these two overhead travelers, of capacity respectively 10 and 15 tons, are operated from one point in the cage, all motions being under the immediate control of one operator. Facilities for handling heavy pieces in this department are admirable.

The railroad track runs through the doorway of this building, so that a car can be pushed in and be set directly underneath the cranes. The heaviest pieces referred to above are in this method handled to the machine shop, the company being well equipped in that department to turn out castings of this kind. In the molding floor it was noticed that all variety and sizes of castings were made, weighing from 1 pound up to 10 tons. In fact, we see no limit to the variety of kind and size. There were castings being made for water, gas and for natural gas. In connection with this latter, it has been proven beyond a doubt that a high grade of cast iron for pipe and specials supersedes the wrought iron which originally was used for this purpose, and as all pipe and specials are made to withstand a pressure of 300 pounds to the square inch, it is reasonable to suppose that they would prove as efficacious as wrought iron. The life of cast iron pipe is unknown, as even the imperfect pipes made in this country in 1804 are now in good condition, in spite of the fact that they are uncoated.

Besides the above mentioned there were also in process of manufacture castings for architectural iron work, heavy bells, hoppers and other castings for blast furnaces, as also light sectional entablatures and bases for gas holder columns.

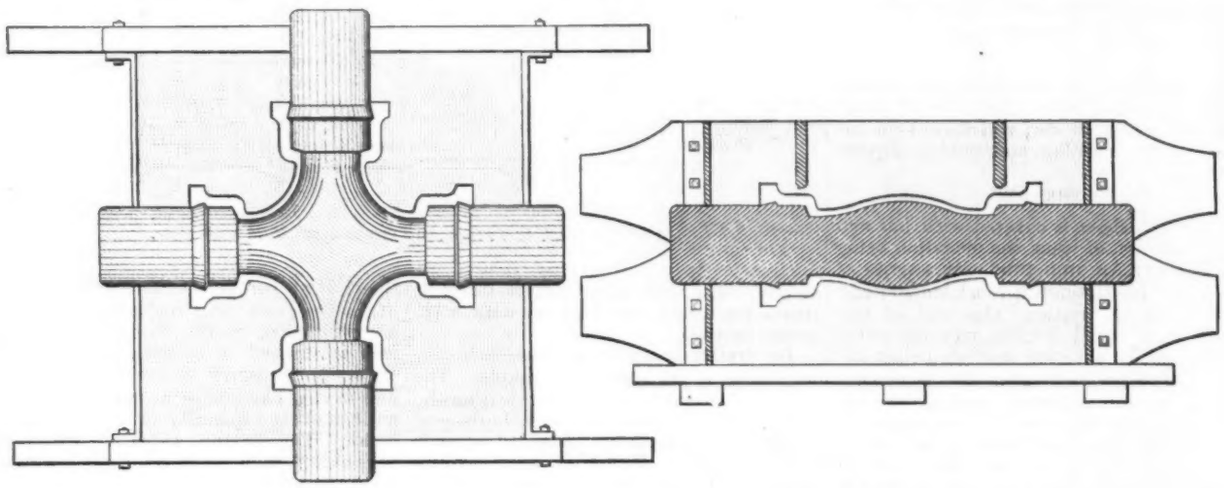
In the northwest corner of this building is a square pit used principally to cast flanged pipe or hydraulic cylinders for elevators. The equipment for this kind of work is complete, hydraulic or steam cylinders being turned out as rapidly as flanged pipe. To insure these being free from blow holes, dirt or any kind of honey comb that would show up in the boring of the casting, a heavy sinking head is used on the upper flange, which is cut off before the casting is shipped. This department has its own cupola separate from the pipe foundry, which is located centrally with the floor space, having also an independent Root blower located adjacent to it.

THE SHIPPING YARD.

Having left this department, we paid a visit to the shipping yard. The manufactured product is all handled by narrow gauge locomotives and cars, and the pipe are racked on skids running at right angles to the track. To facilitate work in the shipping yard, there is provided a steam derrick mounted on a flat car which can be moved from one point to another on a standard gauge track. This machine is capable of lifting 15 tons, and can take the largest pipe manufactured, picking it off the ground and setting it on a flat car in a moment's space of time. A car of 12 pieces of 24-inch pipe weighing two tons each in this way can be loaded in 15 minutes with three men.

Employed in the work of handling the manufactured product are six narrow gauge locomotives and one standard gauge; the amount of track surrounding the plant is in total 11¼ miles. Besides the narrow gauge locomotives above referred to is an equipment of over 100 narrow gauge cars and buggies.

It is the intention of the company at no distant date to enlarge the capacity of their works, so as to meet the increasing demand which now comes from all parts of the country, the high standard of excellence which they have maintained for their product having given them a national reputation.



Plan. Vertical Central Section.

Fig. 8.—Four-Inch Cross Ready for Pouring.

Some of the new land and manufacturing enterprises in the South are being exploited in London at handsome valuations as shown by the following from the London *Financial News:*

	Nominal value of shares.	Present market value.
Jefferson Building and Improvement Company (Alabama)...	£20	£51
Buena Vista Improvement Company (Virginia)	20	27
Anniston City Land Company (Alabama).....	20	250
Bessemer Land and Improvement Company (Alabama)...	20	25
Elyton Land Company (Birmingham, Ala.).....	20	210
Roanoke Land Company (Virginia).....	20	130
American Association (Kentucky, Virginia and Tennessee)	10	24
Middlesborough Town Company (Kentucky)	5	13

A letter writer in Buenos Ayres predicts that eventually the Anglo-Saxon race will take possession of the country "in manners, language and trade." He says there are now 100,000 Englishmen in the city, and that the amount of British capital invested there cannot be less than $75,000,000. They claim that Rio is a Spanish city, and yet two-thirds are foreigners.

Denver capitalists have bought 450 acres near the suburbs of St. Louis for improvement, particularly with the object of attracting manufacturers.

THE SOUTHERN TOUR.

In the evening the trains left Pulaski, Va., travelling during the night over the Norfolk and Western to Pocahontas, on the edge of the famous Flat Top coal field. It had been raining heavily during the day, and there was some danger that land slides might seriously interfere with the movements of the train. Extraordinary efforts were made by E. W. Eddy, general manager of the Norfolk and Western Railroad, to prevent mishap. The whole line was patrolled during the night by an extra force. Thursday morning was given over to visits to the wonderful

Flat Top Coal Region,

the edge of which only was inspected. This region has been developed with extraordinary rapidity through the wise and progressive policy pursued by the Norfolk and Western Railroad, and through the efforts of J. H. Bramwell, E. W. Clark, S. A Crozer and others. How rapid that development has been may be gathered from the following figures, which show the production of coal and coke in tons of 2240 pounds for the years 1883 to 1889, both inclusive:

Production of Flat Top Coal and Coke.

	Coal.	Coke.
1883	60,828	19,805
1884	175,252	52,530
1885	519,358	44,945
1886	766,006	54,441
1887	1,020,141	136,567
1888	1,383,628	180,490
1889	1,618,019	280,007

The Flat Top coal field is worked in a manner peculiar to it. The greater part of the coal-bearing territory is owned or controlled by the Flat Top Coal Land Association, of which E. W. Clark is president, S. F. Tyler vice-president, Clarence M. Clark secretary and treasurer, C. H. Duhring general manager, and F. L. Paddock chief engineer. This association does not itself conduct any mining operations, simply leasing its lands at a royalty of 10 cents per ton of coal produced. It controls in fee 154,942 acres; the mining fee of 41,219 acres, and the surface of 1217 acres, a total of 197,378 acres in Tazewell County, Va, and Mercer, McDowell, Wyoming, Boone and Raleigh counties, W. Va. A tract of about 526 acres is now in litigation. The company has a capital stock of $3,714,100, and paid in 1888 $126,307.50 in dividends, which in 1889 rose to $143,223. Since its organization the association has obtained a surplus revenue of $114,202.59, out of which $120,919.61 was invested in lands, surveys and purchases of stock, which were charged to the capital account. The total production of the different leases of the Flat Top Coal Land Association in coal and coke and the royalties received therefor were as follows for the year 1889:

Lessee.	Coal.	Coke.	Royalty. Coal.	Royalty. Coke.
Southwest Va. Imp. Co.	601,409	72,598	$61,040.83	$10,889.63
Jno. Cooper & Co.	184,071	26,459	18,407.25	3,968.78
Caswell Creek C. & C. Co.	154,321	20,757	16,332.06	8,113.57
Booth-Bowen C. & C. Co.	128,460	12,690	13,746.01	1,903.59
Buckeye C. & C. Co.	106,966	11,875	8,592.23	1,781.23
Goodwill C. & C. Co.	63,984	8,502	3,867.91	1,062.73
Louisville C. & C. Co	47,159	7,444	2,847.53	930.68
Shamokin C. & C. Co.	50,286	14,330	5,854.13	2,147 99
Elkhorn C. & C. Co.	49,754	12,344	5,647.79	1,851.62
Norfolk C. & C. Co.	19,448	5,307	1,944.88	805.13
Totals	1,405,808	192,356	$138,280.59	$28,454.95

Of the above tonnage the railroad shipments were 1,398,274 tons, while the coal for local use was 7534 tons. With the 288,534 tons of slack converted into coke, the total tonnage reaches the figure of 1,694,342 tons of coal mined from the lands of the Flat Top Coal Land Association.

The lessees who mine from the lands of the association confine themselves to the work of producing coal and coke. The marketing of the coal is done by the Pocahontas Coal Company, and that of the coke by the Hull Coal and Coke Company. The Pocahontas Coal Company sends monthly a check to each shipper for the coal mined by him on the basis of 82 cents for run of mine and $1 per ton for lump coal shipped, arranging for the distribution of cars. The Hull Coal and Coke Company is directly under the control of the coke operators, who decide at what price they will market their product, the Hull Coal and Coke Company selling it at an advance of 10 cents a ton. The peculiarity of the coal produced in the Flat Top district is that it is both an excellent steam-raising fuel and a good coke, nearly equal in the latter respect to standard Connellsville coke. This therefore gives the operators of the district the advantage that they can sell their lump coal as a superior steam fuel, while their slack may be converted into coke.

As a coke district the Flat Top has developed rapidly and is likely to expand quickly in the near future. The Norfolk and Western Railroad is now building an extension from the Flat Top field to the Ohio River, at Ironton, and will then be in a position to place coke in the Western markets to very much greater advantage. It was with the object of preparing for the market thus enlarged that the operators of the district have been and are still adding to their coke-producing capacity. We give below a table showing the number of ovens completed and building by the different coke operators in the district:

Coke Ovens in the Flat Top Region.

	Completed.	Under construction.
Southwest Va. Imp. Co	400	250
John Cooper & Co	150	150
Caswell Creek C. & C. Co	136	64
Booth-Bowen C. & C. Co	91	....
Buckeye C & C. Co.	100	....
Goodwill C. & C. Co	50	35
Louisville C. & C. Co	50	25
Elkhorn C & C. Co	100	50
Shamokin C. & C. Co	100	50
Norfolk C. & C. Co., No. 1	100	50
Norfolk C. & C. Co., No. 2	....	120
Turkey Gap C. & C. Co	100	100
Crozer C. & C. Co	214	....
Huston C. & C. Co	100	....
Powhattan C. & C. Co	100	....
Totals	1791	894

The second annual report of the company contains the following data concerning the coal measures:

"The lower coal measures in the Flat Top coal field have a thickness of 1000 to 1200 feet, and there are numerous seams of coal, of which the No. 3, or Pocahontas, is the most valuable, but there are without doubt others that are workable. At Pocahontas, on Mill Creek and Simmons Creek, and on the headwaters of the Elkhorn and Tug rivers, you have a very large area underlaid with the No. 3 seam from 7 feet to 12 feet in thickness. This may be considered as the thickest part or center of this great coal field. The coal is broken off by a fault immediately to the south, and does not appear again in that direction. Toward the northeast it thins on Flipping and Crane creeks, and further east in Mercer County, and on the Guyandotte headwaters in Wyoming County, to 4 to 5 feet. In McDowell County it thins toward the northwest, but not so rapidly as toward the northeast. Where it does under water level on the Elkhorn it shows a thickness of 6 feet, and on Tug about 7 feet.

"In the New River district, on the line of the Chesapeake and Ohio Railroad, which is the northeastern end of the Great Flat top coal field; one of the upper seams, known locally as the 'Sewell' or 'Nuttall' (3½ to 5 feet thick), is regarded as the most valuable for coking, and this seam no doubt exists in good condition on part of your property. As already stated, three workable seams were found on part of your McDowell County lands.

"On your Mercer County lands there is a large area of the No. 6 seam lying about 170 feet above the No. 3, and from 3 feet 8 inches to 4 feet 2 inches thick, and wherever opened it is in good condition, and shows, by analysis, as good quality as the No. 3 seam.

"On account of the immense area of a seam of extraordinary thickness (from 7 to 12 feet), the thinner seams (from 4 to 5 feet) have not been appreciated. Seams of 3 feet to 4 feet 6 inches are regarded as very valuable elsewhere, and are worked extensively throughout Europe and this country.

"To obtain an approximate estimate of the enormous quantity of coal in the No. 3 seam on your land, it may be assumed that three-quarters of your total area, or say about 150,000 acres, is underlaid with this seam, after making a very liberal allowance for erosion of streams and for bottom land, where there is no coal. If we take the average thickness of the seam to be 6 feet, each acre would yield 6000 tons of coal, making a total of 900,000,000 tons ($90,000,000 royalty at 10 cents per ton) for the whole area, and there is besides a very large amount of coal in the other seams. During the past year we exhausted only about 171 acres of your coal land, or say one nine-hundredth part of our total coal area."

The third annual report contains the following interesting statement from the chief engineer:

"Including entries, air courses, rooms where mining is still going on, as well as the parts of the mines which have been robbed and abandoned, a total of 703 acres of coal have been taken out since the mines were first opened. These 703 acres yielded 6,337,525 tons of coal, or 9000 tons per acre. Theoretically the coal per acre for this area amounted to 11,312 tons, so that the amount recovered equals 80 per cent. This percentage is much higher than it will be when the field is all worked out, because the entries and chambers where robbing has not yet been done have yielded nearly 100 per cent., and have brought up the general average, whereas, where robbing has been done, the yield is estimated to have been about 70 per cent. Therefore, as the mines get older and robbing becomes more general, the percentage recovered will be gradually reduced to 70 per cent. The above total acreage worked out—703 acres—represents about one-fifteenth part of the territory now under lease."

The following analyses by a number of leading chemists show the character of the coal:

Analyses of Flat Top Coal.

Analyst.	Water.	Volatile matter.	Fixed carbon.	Sulphur.	Ash.
Andrew S. MacCreath, Harrisburgh	1.011	18.812	74.256	0.730	5.191
Prof. B. Silliman, Yale College	0.47	19.85	77.48	0 63	2.19
Prof. C. F. Chandler, Columbia College, New York	0.52	23.90	74.20	0.52	1.38
Prof. F. A. Genth, University of Pennsylvania, Philadelphia	0.62	18.48	75.22	0 28	5.68
Prof. F. A. Terry, Boston	0.70	17.93	77.89	0 49	2.99
Norway Steel and Iron Company's chemist, Boston	0.45	19.24	76 95	0.71	2 65

The following analyses of Flat Top and other cokes were made by Andrew S. MacCreath :

Analyses of Flat Top and Other Cokes.

Name of coke.	Water.	Volatile matter.	Fixed carbon.	Sulphur.	Ash.
Pocahontas coke, average of three samples	0.347	0.757	92.550	0.597	5.749
Birmingham, Ala., district, average of four samples	0.157	0.803	87.299	1.195	10.545
Chattanooga, Tenn., district, average of four samples	0.447	1.101	80.513	1.595	16.344
Connellsville coke of Pennsylvania, average of three samples	0.060	0.427	88.962	0.810	9.741

The following table will show the destinations of coke from the Flat Top coal field during the last three years :

Destinations.	1887.	1888.	1889.
By groups.	Cars.	Cars.	Cars.
Points on the Norfolk and Western Railroad.	4,324	6,715	9,100
Points on the Shenandoah Valley Railroad.	1,650	379	690
On other roads of Virginia	12	14	13
Southern points (south of Bristol)	1,275	2,717	6,127
Points in North and South Carolina	13	11	12
Chicago, Ill	525	71	.....
East St. Louis	653	527	65
East Carondelet, Mo.	.....	660	54
Louisville, Ky	65	.....	21
Joliet, Ill.	84	.....	.....
Terre Haute, Ind.	3	.....	.....
Centralia, Ill.	...	1	.....
Totals	8,603	11,095	15,983
Representing a total gross tonnage of	134,561 tons.	180,462 tons.	275,042 tons.

The character of the seams and their position is such that the cost of mining must necessarily be low. For mining proper the men are now paid at the rate of 75 cents per 2-ton car, furnishing their own supplies. For entries $1.05 is paid per yard, and for crosscuts $1.05 plus $2 per yard. At these rates the men make excellent wages, even where there is not full work on account of the scarcity of cars. The latter feature has until now hampered an even more rapid development of the district. The Norfolk and Western railroad has been physically unable to handle a greater tonnage, which the mines and coke works could very readily supply. The Norfolk and Western Railroad is now double tracking the greater part of the division, and will soon be in a position to give an outlet to much increased quantities. The markets will be further greatly widened on the completion of the Ohio extension.

With full allowance for inside and outside expenses, and adding the 10-cent royalty, the cost of mining coal in the Flat Top district should not quite reach 60 cents per gross ton. Coke can be made for $1.10 @ $1.15 per short ton.

Southwest Virginia and Birmingham.

The possession of so pure and excellent a fuel and of ores of good quality is what places Southwestern Virginia in so favorable a position for iron making. The materials cannot be quite so cheaply assembled as in the Birmingham district, but they are better in quality, this being notably true in the case of the coke. The result is that the coke consumption in the Virginia furnaces is smaller and that in that respect they have the advantage of Birmingham of about 40 cents per ton of iron. Birmingham has cheaper ore and makes iron at a lower cost, but it takes more money to put the metal into the Eastern markets. Well equipped and well managed furnaces in Virginia should be able to put pig iron into the Philadelphia market for $13.50 to $14 per ton, the freight being $3 per ton, against $4.62 from Birmingham. Even when the plants in the latter district generally reach a cost of $9.50, Southwest Virginia possesses the advantage.

To the plants in Eastern and Central Pennsylvania, New Jersey and New York the most dangerous competitor must be and must remain the Virginia furnaces, to whom the tidewater and New England markets are the natural, and aside from local consumption the only, outlet. Birmingham now sends the bulk of its iron to Ohio River points and north of them. When the new plants in Virginia are running it will be forced to rely even more upon those markets. It is worthy of note that the lead in the development of Southwest Virginia is being taken by men who have been identified with iron making and with the coal interests of Eastern and Central Pennsylvania and Philadelphia. Conspicuous among the enterprises pushed by Philadelphians is the Virginia Development Company, which controls the Southern Virginia Improvement Company. It was the collieries of the latter which were visited by the party at Pocahontas.

The Virginia Development Company is the successor of the Virginia Steel Company, organized in 1887 to carry on iron ore mining operations. In May of 1889 parties largely interested in coal, iron and railroad properties in Southwest Virginia decided that it would be profitable to enlarge their operations by building blast furnaces, rolling mills, foundries, &c., and to generally develop the country on the lines of the Norfolk and Western and Shenandoah Valley railroads. In August of last year the stock was increased from $100,000 to $5,000,000, and subsequently a further increase to $20,000,000 was authorized. A controlling interest was purchased in the stock of the Southwest Virginia Improvement Company, which is the lessee of over 3700 acres in the Flat Top district, and the net earnings of which were $102,222.59 in 1888 and $63,129 in 1889, the shipments having been in 1889 542,543 tons of coal and 99,508 tons of coke. Although the company began its operations only in the fall of 1889, its surplus for that year was $55,860.07. Besides its control of the Southwest Virginia Improvement Company, the concerns owns the Rorer iron mines, near Roanoke, with six miles of railroad and equipment to turn out 3500 tons of ore per month, which is to be increased to 6000. They control the Clark Summit mines, with a present capacity of about 2500 tons of iron ore per month, which it is proposed to increase to 5000; the Alsonia iron mines, on the Cripple Creek extension, with a present monthly capacity of 1500 tons, to be increased to 3000. The company holds 1000 shares of the Buena Vista Company, 500 shares of the Buena Vista Iron Company, 4000 shares in the Salem Improvement Company, 300 shares in the Graham Land and Improvement Company, 500 shares in the Graham Furnace Company, 750 shares in the Max Meadows Land and Improvement Company, 750 shares in the Max Meadows Iron Company, and 250 shares in the Norton Land and Improvement Company. Since the beginning of the year a subscription of $20,000 has been made to the Crystal Spring Land Company, a loan to the Roanoke Rolling Mill Company of $13,000, a subscription of 1000 shares to the Central Land Company, of Buchanan, of 150 shares to the Radford West End Land Company, and of 1000 shares to the Virginia Real Estate Investment Association. An interesting investment has been a subscription to the Sigua Iron Company. A syndicate of 30 shares was formed for the purpose of taking an option on the Bessemer iron ore mine in Cuba. The company secured two shares and $2000 has been assessed on each share. After examination, it was decided to purchase the leasehold of the property, and the company will subscribe to $70,000 of the stock of the new venture. The incentive to this investment was that the ore might at some future day be of great value to the company, as it could be landed at Norfolk and transported in return empty coal cars to the furnaces for the manufacture of Bessemer pig. Among the proposed investments are the building of new coke ovens, requiring $200,000, and the increase of the equipment of iron mines requiring $50,000. It is proposed also to take an interest in the town of Radford and in the Radford-Crane Iron Company. On May 2 of the second year, according to a statement printed, the money available for 1889 for new investments was $332,854. The general manager of the company is Edmund C. Pechin, who is widely known in this country; while H. S. Chauvenet, who for so long a time managed the Robesonia furnace, is now in general charge of the Buena Vista, Salem, Max Meadows and Graham furnaces, with headquarters at Philadelphia. The officers of the company are: Richard S. Brock, the well known Lebanon iron master, president; while Clarence M. Clark is first vice-president and treasurer; S. A. Chauvenet is second vice-president, and E. J. Collins is secretary.

After spending Friday morning at Pocahontas the trains proceeded along the beautiful New River Valley to Luray Cave, arriving there in the afternoon. The party was cordially welcomed by G. C. Marshall, general manager of the company which is now developing Luray, and was conducted through the cave, which is unquestionably the finest thus far opened in this country, and is attracting a growing number of sight-seers. The run to Washington was slow, and in the case of the third section was much delayed by the derailing of an engine at Rivington, so that the party reached Washington only on Saturday morning.

The Washington Local Committee had provided for visits to the departments during the morning, the arrangements being in the charge of Dr. David T. Day. In the afternoon the President and Mrs. Harrison, Secretaries Windom, Noble and Rusk, received the foreign guests at the White House, the Northern section having joined their Southern associates at Washington. In the evening the citizens of Washington, under the leadership of Major J. W. Powell, Director of the Geological Survey, tendered a reception at the Arlington Hotel, which was voted a great success by all participants. Monday morning the trains left Washington, one of them carrying those who intended to go directly to New York, while the other conveyed those of the Southern party who desired to proceed, after visiting Baltimore, to Niagara Falls and Canada.

At Baltimore the trains left the main road to accept the invitation of Major L. S. Bent and F. W. Wood, of the Pennsylvania Steel Company, to visit the Sparrows' Point Works of that concern.

The Works at Sparrows' Point.

During the past decade no bolder, and in many respects no more significant step has been taken by a large concern identified with the Eastern iron trade than the establishment of great works at tidewater by the Pennsylvania Steel Company, of Steelton, near Harrisburg, Pa. We believe that it is the first conspicuous example in the iron trade of the country in which a company known to be prosperous has decided to depart from the policy of

enlarging its establishment at the locality where it grew and developed, and to create a new plant at a considerable distance from the parent works. The location at tidewater admits of assembling cheaply raw materials, like ore and limestone, and shipping product, while it opens out opportunities to engage in industries like shipbuilding, which an inland location makes impossible. Practically, so far as coke is concerned, Sparrows' Point is as favorably located as Steelton, while other sources of supply are more readily accessible under certain contingencies.

In 1887 the Pennsylvania Steel Company purchased a tract of about 1000 acres at Sparrows' Point, Md., on the north shore of the Patapsco River, about nine miles from Baltimore. After the most exhaustive study of the best practice in this country and abroad, plans were successfully developed for the great establishment which is now being created, the first being

THE FURNACE PLANT,

which is now approaching completion, two furnaces having been in operation for some time, to be followed soon by the third and fourth. The main axis of the plant is parallel to the shore of the bay, at some distance from it, with ample space for tracks between the long stock house and the shore. The stock house, a building with stone retaining wall and steel superstructure, is 1125 feet long, traversed by a trestle with four tracks 20 feet high. The furnaces form practically two groups of two, separated from one another by the engine and boiler house. Each group of two furnaces has between it the hot blast stoves, eight in number.

Immediately adjoining the stock house for each furnace is the double stock hoist, with a platform 13 feet square, capable of taking four barrows at a time. They are driven by Crane engines, with special arrangements to prevent overwinding. The furnaces are placed in a line 113 feet distant from the center line of the stock house. Each has its cast house, 62 x 77 feet, built of steel on stone walls. Along the outer side of the cast house runs the cinder car track, the cast house floor being a corresponding hight above the level of the rails. The iron track is placed along the other side of the cast house, and is so arranged that the iron can be carried off in a molten condition for the direct process. Between each group of furnaces is located the battery of Babcock & Wilcox boilers, between which and the hot blast stoves stands the draft stack, which serves the two furnaces. Back of the boiler house of the first two furnaces is a dynamo house.

The furnaces themselves are 85 feet high, with 22-foot bosh. The furnaces are blown through eight tuyeres. The stock thus far used has been Juragua (Cuban) and Mediterranean ore, limestone of exceptional purity from Texas, and Connellsville coke.

At present the stock is charged in the ordinary manner, being run to the hoist in barrows. The bell is raised and lowered by a specially designed pneumatic cylinder. An electric train is being tested for conveying the stock piles to the hoist. On a depressed track, close to and running along the furnaces side of the stock house, runs a car, the platform of which is flush with the stock house floor. It is designed to carry two stock cars, each of the capacity of two barrows, with drop bottoms. In the front of the car is the electric motor, the current being taken by an upright rod pressing against an overhead copper cable. The cars are to be run on the hoist and allowed to run by gravity over the tunnel head, where their contents will be dropped on the bell through the bottom. Practically, therefore, the electric train will reduce the labor of conveying the ore to that of pushing the car from the bin to the nearest point along the tracks and to running it off the electric car to the platform of the hoist. The hot blast stoves are of the Whitwell type, 22 feet in diameter and 70 feet high. The battery of boilers for two furnaces consist of Babcock & Wilcox boilers of 40,000 horse-power.

For cooling and general use about the furnaces water is drawn from the Patapsco, which is only slightly brackish, through a culvert of sufficient size to furnish all that the works will require for some years. That for boilers and the town use is still obtained from artesian wells sunk through the clay to a stratum of fine gravel about 100 feet below the surface, which furnishes an abundant supply of excellent quality.

The blowing and pumping engines for the whole plant are located in the engine house, placed between the two groups of two furnaces. The engine house foundation extends beyond the present structure, the end of which is closed by a merely temporary wall. It contains four blowing engines built by the Southwark Foundry. As planned, the structure will have room for two additional engines. The engines are vertical duplex, with fly wheel, the blowing cylinders a diameter of 80 inches, while the stroke is 5 feet. The engines were designed by J. P. Ladd, mechanical engineer, now in immediate charge of construction at Sparrow's Point. The pumping plant consists of two horizontal compound duplex pumps, designed by J. P. Ladd. The foundations are in for two additional pumps of the same type. A simple lever rig connects the accumulator and the steam valve of the pumps, automatically controlling the latter. In the same room is the dynamo for the light plant of the furnaces and buildings, and the dynamo for the electric stock transfer train from the bins to the hoists.

At some distance back from the shore, with its center line normal to the center line of the blast furnace plant,

THE BESSEMER PLANT

has been laid out. It is to contain four 18-ton converters, one of the notable features of the plant being that practically it will have no pit. At the time of the visit the buildings, imposing in their size and hight, were completed

In a line with the Bessemer plant is the rail mill. The Bessemer plant will be equipped to work with either direct metal from the blast furnaces or remelted metal from the cupolas. The plant is designed for four 18-ton converters, having a daily capacity of 2000 tons. The blooming mill will be of the "two high" reversing type, with rolls 36 inches in diameter, driven by a pair of 42 x 60 reversing engines. Beyond the rolls will be a hydraulic shear for cutting off the ends of the blooms. The blooms will pass direct from the blooming mill table through the shear to the rail train, where they will be rolled into rails without reheating. The rail train will be "three high," with rolls 26 inches in diameter, driven by two 48 x 66 Porter-Allen engines This train will be fitted with appliances for handling the bars from the different passes mechanically, and will be capable of turning out finished rails six lengths (180 feet) each. Beyond the rail train will be erected the sawing, straightening and drilling apparatus.

On that portion of the property lying between the Bessemer and rail department an extensive plant of open hearth furnaces is projected, the product of which will be distributed among the blooming mills, plate and structural mills to be erected in connection with them. These furnaces will probably be of the tilting type, successfully tested at the Steelton plant of the company.

MARINE PLANT.

The various buildings of this department are now practically completed, awaiting the machinery which will prepare the material for the hulls of the vessels. On the fitting out pier, now in course of construction, will be erected a machine shop, also hoisting shears of 100 tons capacity. There are now completed four slips for vessels 250 to 300 feet long, others for larger vessels to be added as required.

BRICK YARD.

A brick manufacturing plant with a daily capacity of 25,000 red bricks is operated by the company, an abundance of clay for many years' supply lying adjacent to the yard.

MACHINE SHOP.

The machine shops, one section of which is now erected and partly in operation, are intended to produce the apparatus required for the extension of the manufacturing plant, and the engines and other machinery required by the shipbuilding department. The present shop is one of three bays, of which the other two will be used as erecting and light tool shops.

THE FOUNDRY.

One of the buildings approaching completion is the foundry, a structure with two lean-tos. The main floor is to be commanded by a 50-ton overhead electric traveling crane, for which the track is now in place. The foundry has two cupolas served by an elevator. The blast is provided by Baker blowers, located in an adjoining structure, in which is placed also the electric light machinery for the foundry and the machine shop near by. The cupolas are flanked by two 18-ton hydraulic cranes of special design. At the pattern shop miscellaneous patterns are being turned out. This, as well as the adjoining buildings, is constructed with temporary ends, with the purpose of future extension.

While in itself the creation of so large an establishment calls for executive ability and engineering skill of the highest order, there were presented to the management of the Pennsylvania Steel Company the additional problems of simultaneously laying out on a broad foundation an industrial town. In other words, it was necessary to gather not alone the materials and machinery for a great plant, but to provide simultaneously for the housing and the material welfare of a growing population. As the work progressed new houses had to be built and facilities afforded for the purchase of all the supplies and daily necessities for such a community—for its schools and its churches. The company have built a large number of houses for workmen, which are rented at a low figure. A number of residences have been built and are under construction for the officials of the company. A very handsome store has been built, in which everything may be purchased which a working population may be in need of, except intoxicating beverages. A law has been passed by the State of Maryland prohibiting the sale of liquor within two miles of Sparrows' Point. In order to afford to the men a comfortable locality to spend their leisure hours, the company have provided a reading and smoking room.

The greater part of the building materials have been obtained in the immediate vicinity. The soil is a clay which makes a good brick for all ordinary purposes. A Martin brick machine and a large yard have been continuously at work for a long time. The lumber is obtained from the Williamsport and Chesapeake Lumber Company, located at Sparrows' Point.

During the floods a large number of logs were floated down the Chesapeake.

These were gathered by tugs, upward of 2,000,000 having been captured. The company are running a new handsome mill, with three band saws. To create facilities for the reception of new materials and the shipping of product, the Pennsylvania Steel Company have constructed two docks, with special discharging machinery. A wide and deep channel has been dredged to reach the main channel of the Chesapeake Bay. The Sparrows' Point Works have connections with two great systems, the Pennsylvania Railroad and the Baltimore and Ohio.

After a tour through the great establishment the visitors were entertained handsomely at luncheon. Those who intended to reach New York on that evening took a train of coaches, while the Niagara and Canada party accepted the invitation of the citizens of Baltimore, who showed them their harbor and terminal facilities, entertaining them on the steamer, and finally landing them at the Central Wharf, where their train of Pullman coaches was in readiness. Quite a number of this section merely spent a day at Niagara Falls, returning to New York. This ended the official programme of the American Reception Committee. About 50 or 60 accepted the invitation of the Thomson-Houston Electric Company, leaving New York on the steamer Pilgrim, on Tuesday evening, visiting the plant at Lynn, where they were entertained at luncheon. In the afternoon they enjoyed a ride through the city and suburbs, and in the evening were tendered a banquet at the Vendome Hotel. About 150 of the visiting ironmasters and their ladies accepted the hospitality of the Canadian Government and its leading cities, going to Hamilton, Sudbury, Ottawa, Montreal and Quebec. They are expected to return on the 7th inst.

PROVIDENCE MISCELLANY.

A meeting of the Rhode Island Engineers' Association was held at the Narragansett Hotel on the evening of October 20 to consider the advisability of inviting the American Society of Mechanical Engineers to hold their spring meeting in this city. The subject was discussed thoroughly, and will be decided definitely at the November meeting.

The Providence Belting Company are making the biggest leather belt ever manufactured. It is for B. B. & R. Knight, is 112 feet long, 48 inches wide and three ply. Two thousand hides had to be examined to get the 65 centers required.

It is reported that the Thornycroft boiler is to be built by the Herreshoffs on an extensive scale. The trials on the Cushing so far have given the best results.

First Lieut. Douglas A. Howard, of the United States Army, who has been stationed for inspection duty at the Builders' Foundry, in this city, has been relieved and ordered to report for duty in the Ordnance Bureau. The Builders' Foundry has a Government contract for the manufacture of 12-inch mortars.

Another important deal with foreign woolen manufacturers will probably soon take place in this vicinity. Charles Barrez, the senior member of the firm of Charles Barrez & Co., 454 Broome street, New York, is at the head of the combination. It is the intention of the corporation to erect a $2,000,000 mill.

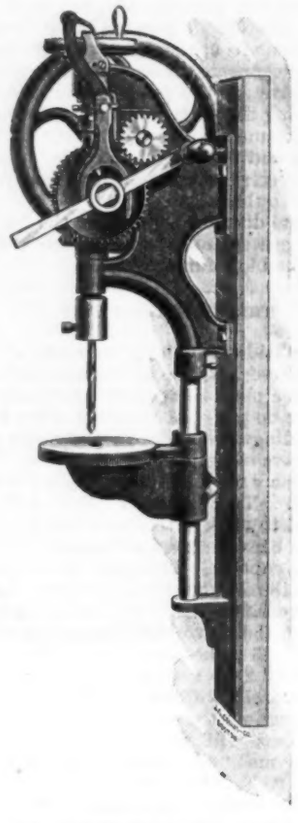
For several months the traveler between this city and Worcester has seen, just after passing Woonsocket depot, a new mill in course of construction. This is the new Alice mill of the Woonsocket Rubber Company. It faces the west, the main building being 420 feet long, 67 feet wide and four stories high. The two wings are 137 x 58⅔ feet, all four stories high. On the front are two towers, known as the east and west towers, each 31 feet square. On both sides of the main building is a long building, one for use as a storehouse, which is 202 x 60 feet; the other, for a box shop, is 202 x 40 feet. Between the wings above referred to is a building in which are the engines and boilers.

At a special meeting of the stockholders of the Nicholson File Company, at the company's office, October 23, it was voted to authorize the directors to conclude the purchase of the new American File Company's plant, located at Pawtucket. It is understood that the treasurer of the American File Company, Joseph E. Jenckes, will retire from that position, but that the superintendent of the works will remain, and there will probably be little change in the works, at least at present. This new combination will form one of the largest file manufacturing concerns in the United States, and will have, when contemplated improvements are completed, facilities for producing fully one-fourth of all the files used in the country. The Nicholson Company have recently been engaged in making, besides all other kinds of files, fine jewelers' and watchmakers' files—about the only kind now imported—and the company hope soon to be able to supply the entire country with this class of files, and make importation unnecessary. The New American File Company, formerly the American, are an old established concern. The firm was reorganized about 14 years ago, and the name of the corporation changed to the New American Company, and the capital stock increased. There are two other file concerns in Pawtucket—the Buckley and Sweeney companies—and it is believed that they are in the combination.

A controlling interest in the Providence Cable Tramway Company was sold October 23 to parties who purchased it in the interest of the Union Railroad Company. The price paid for the amount of stock purchased was $130 per share, and the purchasers have, it is understood, absorbed more than one-half of the capital stock of $500,000.

Upright Drill.

This machine, made by Brown, McClure & Co., of Boston, Mass., is designed for light drilling. It has automatic feed



The Boston Excelsior Drill.

and will drill a hole to the center of a 10-inch circle, 2 inches deep. The greatest distance from the spindle to the table is 10 inches. The drill socket screws on to the spindle and takes a drill with ½-inch round shank. The swing table is 7 inches in diameter. The spindle is 1¼-inch in diameter. The weight of the machine is 80 pounds.

A Boston paper says: "The National Tube Works Company stock advanced recently from $145 to $195 per share upon the raising of the dividend rate from 10 per cent. to 12 per cent. The company is understood to be earning 20 per cent. upon its capital of $3,000,000, and to have a surplus of $3,400,000, which makes the book value of the shares about $214."

New Express Rates.

As a result of the recent traffic arrangement between the Adams, American, National, Northern Pacific, Southern, Wells, Fargo & Co., the United States and the Baltimore and Ohio Express companies, a new schedule of rates has just been issued. The express rate between New York, Boston, Baltimore and Washington is fixed at $1 per 100 pounds, and no allowance is to be made for fractions. The rate to Philadelphia is 60 cents per 100 pounds. The New York rates apply to Bloomfield, Communipaw, Hoboken, Jersey City, Montclair, Newark, Orange, Paterson and Weehawken, but, strangely enough, the charge from Brooklyn will be 25 cents per 100 pounds more. The part of the schedule that will probably cause discontent among New York patrons of the companies is that which deals with Western points. It makes the rates from New York to these places 25 cents higher than those from Baltimore, Washington and Philadelphia, and on a parity with those of Boston. Here are some of the new tariff rates:

	Old rate.	New rate.
Colorado—Denver	$8.00	$8.50
Dakotas—Fargo	5.50	6.50
Sioux Falls	4.50	5.25
Yankton	4.50	5.25
Illinois—Chicago	2.00	2.50
Evanston	2.25	2.75
Joliet	2.25	2.75
Peoria	2.75	3.25
Quincy	3.00	3.75
Rock Island	3.25	3.75
Indiana—Fort Wayne	1.75	2.25
Indianapolis	1.75	2.25
Iowa—Council Bluffs	4.00	4.50
Sioux City	4.00	4.50
Kansas—Kansas City	4.00	4.50
Kentucky—Louisville	2.25	2.50
Louisiana—New Orleans	4.25	5.00
Minnesota—Duluth	4.00	5.00
Minneapolis	4.00	4.50
St. Paul	4.00	4.50
Stillwater	4.00	4.75
Missouri—Kansas City	4.00	4.50
St Louis	2.50	3.00
Montana—Butte, Boulder, Helena	10.00	11.50
Nebraska—Omaha	4.00	4.50
Ohio—Cincinnati	1.75	2.00
Cleveland	1.50	1.75
Toledo	1.75	2.00
Youngstown	1.50	1.75
Tennessee—Chattanooga	3.00	3.50
Memphis	3.50	4.00

The rates to California remain unchanged, probably because they were so high before that the companies could not conscientiously advance them; but packages for Galveston, Texas, will have to pay 50 cents more; for Milwaukee, Wis., 75 cents more, and for Ogden and Salt Lake City 50 cents more, or $10.50 per 100 pounds.

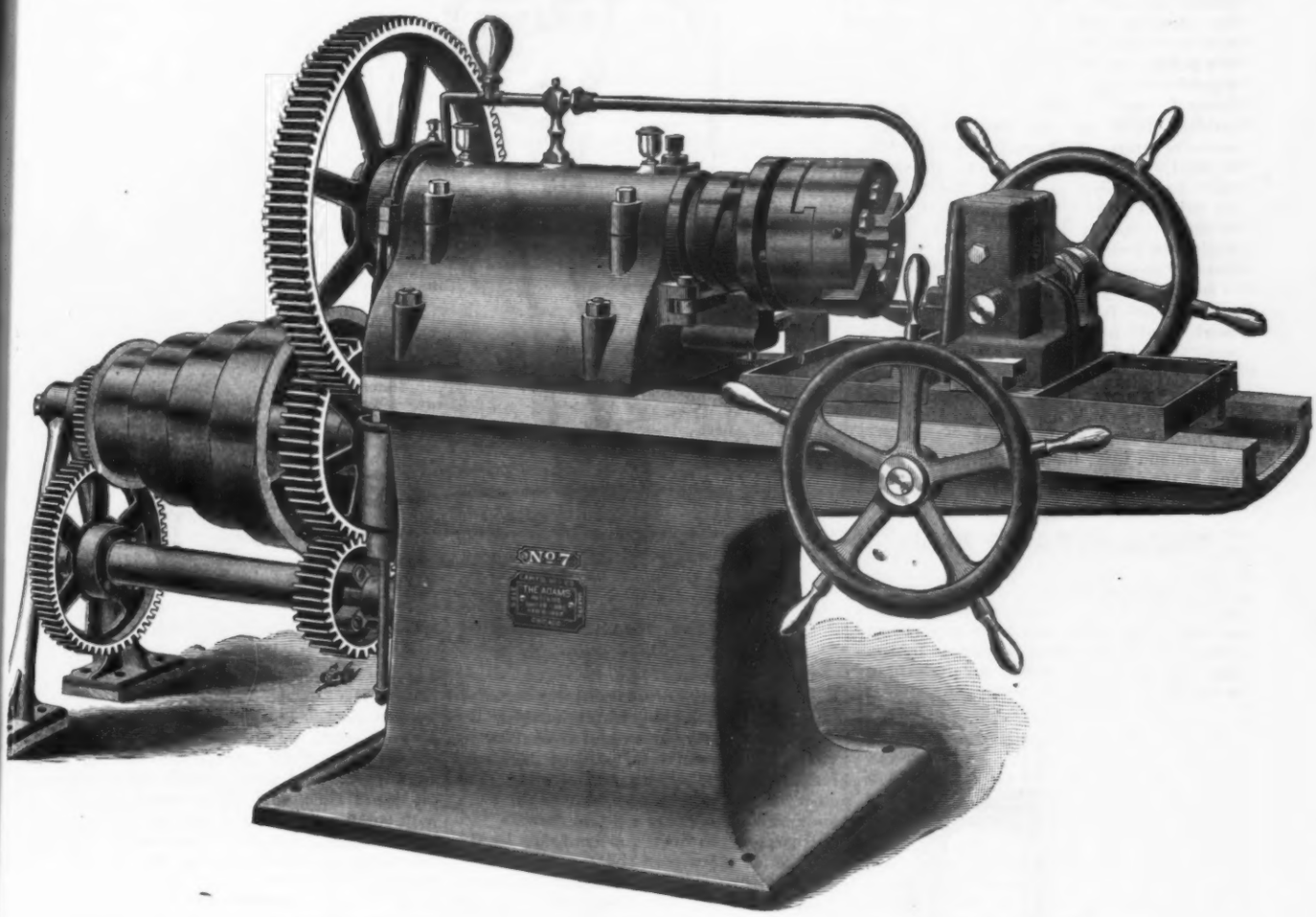
The New York Ice Company, in this city, will soon add two plants for manufacturing artificial ice to the one already in operation, and believe that it can supersede nature's product, because of the saving in the cost of transportation.

The Mississippi constitutional convention adopted a provision exempting from taxation for ten years all "manufacturers of cotton, wool, silk, furs, metals or manufacturing implements of use in a finished state hereafter established." This is a very proper step to be taken in Mississippi, as that State needs manufacturing establishments very decidedly. There are some manufactories of importance now located in the State, but they are very few, yet the climate, location and other natural advantages of that part of the Union are exceedingly favorable to their establishment and development. Exemption from taxation is a very mild inducement, it is true, but the adoption of such a provision will certainly help rather than hinder industrial development.

Automatic Threading and Nut Tapping Machine.

The engraving represents a single 3-inch, or No. 7, Adams Automatic Threading and Nut Tapping Machine, built by the Capitol Mfg. Company, of Chicago, Ill. This machine is capable of threading and tapping from ¼ to 3 inches, and is also manufactured in the double style.

The head, as well as the automatic opening and closing device for releasing the work after it has been threaded, is the same as previously described and illustrated in this paper, excepting that on this and larger sizes a steel ring is placed around the head, which firmly holds it together and prevents any possible spring. This ring acts as a positive and automatic lock the moment the machine commences to work. The machine is also strongly back geared, and especially adapted for establishments threading large numbers of same sized work, as wagon axles, heavy bridge rods and similar work where accuracy and a thread close under the head is required, also for threading pipe, nipples, plugs, &c., for which last purpose a special machine is made. The dies are simple and inexpensive and can be rehobbed several times. It is claimed that the capacity of this machine is very much greater than, and the work superior to, that of any other. It is made in all sizes from ⅜ up to 8 inches.



THE ADAMS AUTOMATIC THREADING AND NUT TAPPING MACHINE.

The magnitude of the corn crop in the United States excites the wonder of the people in countries where corn is not raised, or raised only to a limited extent. Corn, or maize, is emphatically an American product, and some writers estimate that it is consumed by more people than any other grain except rice. The years of highest export were 1876 and the next four; the average was 88,000,000 bushels, one year, 1879, showing an export of nearly 100,000,000. In the year ending June 30, 1879, the United Kingdom took 64,000,000 bushels, and the next year 56,000,000. The export of last year was 69,000,000 bushels; of the year before 25,000,000 bushels.

A Novel Question in Trade-Mark Law.

We are indebted to Howson & Howson, of New York, for the following opinion by Judge Bradley, of the Circuit Court of the United States for the Eastern District of Pennsylvania, in the case of the New York and Rosendale Cement Company *vs.* Coplay Cement Company.

The defendants manufacture and sell cement which they denominate and put upon the market as Anchor Rosendale cement, though made in Lehigh County, Pa., from stone quarried there. The complainants manufacture cement in the town of Rosendale, in the State of New York, where there are extensive quarries of cement rock, which are worked by some 15 or 20 different parties. Some of these Rosendale quarries have been worked for over half a century, but the complainants commenced their operations about 1874. The cement made in Rosendale and its vicinity has always been called Rosendale cement; and the complainants contend that the term has acquired a generic signification applicable to the hydraulic cement manufactured at Rosendale and vicinity, and inhering in the marketable quality of the cements manufactured by the complainants and others. The bill is filed for the purpose of enjoining the defendants from using the word "Rosendale" in describing their cement, and to obtain damages and an account of profits for such use. The relief sought is based on the charge that the denomination used is untrue, is calculated to deceive the public, and operates as an unfair and fraudulent competition against the business of the complainants. They do not pretend that they have any exclusive right to the use of the term "Rosendale," since it is equally used by the other manufacturers of cement in the town, some of whom have establishments of much longer standing than that of the complainants; but they insist that they have a right to use it and to participate in the advantages which are attached to it as enhancing the marketable value of their cement.

The defendants contend that the name "Rosendale cement" has ceased to have a mere local significance or application, and has come be a generic term, used to designate the common grade or class of cements otherwise known as American natural cements, to distinguish them from the higher grade, or class of cements known as Portland cement—this general class of cement being, by force of accident, called Rosendale cement, because it was first made in Rosendale.

Much evidence has been taken by the parties on this controverted question. But the view of the case which we have taken obviates the necessity of examining this evidence.

Though it be conceded that the name Rosendale Cement is understood by the public as designating the place where it is made and comes from, and that the defendants untruly call their cement by that name, the question still remains whether they can be prosecuted therefor at the suit of a private party who is only one of the

many who manufacture cement at Rosendale and truly denominate their cement Rosendale cement. Would not the allowance of such an action be carrying the doctrine of liability for unfair competition in business too far? The counsel for the complainants frankly concedes that the principle for which he contends would en able any crockery merchant of Dresden or elsewhere, interested in the particular trade, to sue a dealer of New York or Philadelphia who would sell an article as Dresden china when it was not Dresden china. It seems to us that this would open a Pandora's box of vexatious litigation.

The law furnishes us with an instructive analogy on this subject. No man can maintain a private action for a public nuisance, though he is injured by it, unless his injury is of a special character, different from that which is sustained by the public generally. This is a sound rule of the common law. It is intended to prevent vexatious litigation; when an injury is a public one it should be prosecuted as a public wrong. So here, the wrong (if there is one) is committed against the public. If it be said that the cement manufacturers of Rosendale are specially injured, because their trade is affected, it may be p;operly answered that they are all injured alike; it is a public injury as to them, just as it would be to all the dealers in linens for a man to sell as Irish linens fabrics that are not such.

In our view, if a person seeks to restrain others from using a particular trademark, trade name, or style of goods, he must show that he has an exclusive ownership of property therein. To show that he has a mere right, in common with others, to use it is insufficient.

The bill must be dismissed.

Rowland Cox, for complainant. Howson & Howson and P. K. Erdman for defendant.

Tapping and Reaming Machine.

The object aimed at in the construction of this chuck is to overcome the difficulty of tapping and reaming holes straight and true, particularly when a plug or bottoming tap has to be used, for in tapping with these it is not always possible to

Hand Tapping and Reaming Machine.

start them in true with the ordinary tap wrench. The 1-inch steel spindle is threaded to receive a chuck, has a free movement of 8½ inches through the overhanging arm and is balanced by a weight back of the column. The arm can be raised or lowered on the column and swung completely around it; a binding screw holds it in position. The revolving face plate has four ⊥ slots cast in it and may be firmly fastened by a lever binding screw. If placed on a bench near a vise the arm may be swung so as to permit the machine to operate on any work held in the jaws. This machine is made by Geo. Woodworth, of 341 Halsey street, Brooklyn, N. Y.

Grinding and Polishing Machine.

The swing frame grinding and polishing machine is coming into use quite largely in manufactories where the smoothing or finishing of large surfaces in cast plate iron

SWING FRAME GRINDING AND POLISHING MACHINE.

is desired, either before polishing or painting. It is a machine which enables the operator to cover an extended surface by virtue of its universal motion back and forth, sidewise or up and down. The emery wheel may be carried over the work and inclined to either side, so that its face will conform to bevels or contours in the surface, at the will of the operator.

In construction it is a simple swinging frame provided with telescopic suspending rods, and counterpoised by a weight, as shown in the engraving. The running shafts are all free and independent of the joints of the machine. The machine may be used in conjunction with a solid emery wheel for grinding off sprues, fins and lumps, and with a wooden polishing wheel or buff wheel for polishing. It is also a good brush machine for cleaning sand from large castings in a foundry. It is made by Cutter & Wood, successors to the Union Stone Company, 35 Arch street, Boston, Mass.

Officials of the Navy Department at Washington have discovered a flaw in one of the castings which supports the shaft of the new armored cruiser Maine, which will entail expense and delay before the vessel can be finished. Experts attribute the flaw to the presence of air in the flask while the casting was being made.

At the Bethlehem Iron Works, in Pennsylvania, a converter tipped, burning several men, one of them fatally.

Protecting Puddlers from Heat.

At the Menden and Schwerte Ironworks, in Westphalia, a method, devised by M. H. Koppmayer, has been adopted for protecting the workmen at the puddling and heating furnaces from the heat radiated from the interior and the casing plates. It consists of a rectangular iron screen hanging from an overhead rail, which can be made to cover the whole working side of the furnace, or can be pushed aside when not required. The lower end is bent over into a gutter, which has a slight fall in the direction of its length, and the upper edge is provided on the inside, that nearest the furnace, with a pipe bored through with small holes about ¼ inch apart, which is in connnection with the service pipe supplying water for cooling the sides of the bed. When in use the inside of the plate is kept constantly wet from the supply pipe, the small jets trickling down to the gutter at the bottom and running away to the cooling bosh at the side. A notch at the bottom is left for the passage of the rabble, and a short inclined plate is provided for the cinder to run over; but, with these exceptions, the whole surface is screened by the water cooled plate. At the time of baling up the water is shut off and the screen is run to one side, when the furnace is accessible in the ordinary way. This arrangement, which was first applied experimentally to a few furnaces, has worked so satisfactorily that it has been fitted to the whole of the puddling furnaces in the works, as it is found that the puddlers, being protected in great part from the exhausting effect of the heat, can work full time even in the summer weather.

At Dayton, Tenn., just north of Chattanooga, where the Dayton Coal and Iron Company have an extensive plant, land has been purchased by Chicago capitalists and others, who have already issued shares to the extent of $1,500,000, and expect to profit largely by the operation.

NOTES BY A GERMAN ENGINEER.

The members of the British and German technical societies recently in this country made free use of their note books. It would be extremely interesting to Americans if they could have the privilege of reading the observations made by the shrewdest of these observers. Unfavorable criticisms should be expected to some extent, as our own people are conscious of shortcomings in various directions, but the visitors must have seen so much that is novel to them that their impressions on such topics would be worth knowing. It may be taken for granted that, however prejudiced a man may be against the methods adopted by the people of other countries than his own, there were very few practical men among our guests who were not prepared to make careful observations of the processes employed here, with a view of learning something that might be of value. We are inclined to take the more interest in this matter from the fact that we have had the pleasure of examining the notes made by an eminent German engineer, who was then making his first visit to this country, and who inspected everything he saw with all the ardor of a discoverer. The machinery in use was of special interest to him as a mechanical engineer, and the following extracts from his note book indicate how much he saw in his hurried trip that struck him as possessing more than ordinary merit:

The American Pneumatic Tool Company, of New York, make small instruments for calking boilers which are driven by air. They are very efficient.

A very large punch made by the Niles Tool Works, of Hamilton, Ohio, was seen at the Continental Iron Works, in New York. It is an excellent tool and most admirably constructed.

Saw in New York the Gibson storage battery, made by the Ford Surgical Company. This is suited to heavy work, and possesses the excellent qualities of lightest weight with greatest energy.

The Edison shop, at East Orange, N. J., contained a great deal of very fine machinery. Among this was a very good planer, built by Bement, Miles & Co., of Philadelphia. A steam engine, built by G. H. Brown & Co., of Fitchburg, Mass., built to run at low speed, showed excellent construction. An Armington & Sims high speed engine was also doing good work.

At the Disston Saw Works, Tacony, Pa., was shown a remarkable shear, built by the Lewis Foundry and Machine Company, of Pittsburgh. It makes a cut which is so clean that no file work is afterward required to fit the piece for subsequent use.

In a cable railway power house in Philadelphia was seen an ingenious arrangement of drums for winding wire rope, manufactured by Robert Wetherill & Co., of Chester, Pa.

The new shops of the Pennsylvania Railroad Company, at Altoona, Pa., have a magnificent equipment of high class machinery, some of which is especially noticeable. A new forging press, remarkably simple and very efficient, was designed by Paul Kreutzpointner. Another good forging press is the work of the S. C. Forsaith Machine Company, of Manchester, N. H. A shear manufactured by the Walker Mfg. Company, of Cleveland, Ohio, had numerous good points about it. An interesting device is the Roney mechanical stoker, used for firing the furnaces under the boilers. A very good screw cutting machine was seen in operation, and was built by Eaton, Cole & Burnham, of Bridgeport, Conn. An exceedingly fine revolving lathe is the work of the Jones & Lamson Machine Company, of Springfield, Vt. The Brown & Sharpe Mfg. Company, of Providence, R. I., have a very ingenious machine at work sharpening reamers automatically with an emery wheel. The hydraulic pumps used in this shop are very simple, very strong and very cheap. Among other machinery attracting much attention were a punching machine built by Mackintosh, Hemphill & Co., of Pittsburgh, and a testing machine made by Riehlé Bros., of Philadelphia.

In the machine shop of the Cambria Iron Company, at Johnstown, Pa., was seen a well constructed self-acting punching machine manufactured by Hilles & Jones, of Wilmington, Del., also a remarkably cheap and good steam riveter made by Pusey & Jones, of Wilmington. A very complete self-acting punching machine requiring no skilled labor to operate it was made by the Long & Alstatter Company, of Hamilton, Ohio. In the foundry was seen a capital steam stand crane of cheap and simple construction, made by Penn Bros., of Philadelphia. The Morgan Engineering Company, of Alliance, Ohio, have two Wellman cranes in use in these works, which are noted as very good.

Julian Kennedy's hydraulic crane in the Latrobe Steel Works, at Latrobe, Pa., which make all movements, was thought by the German engineers to be the most perfect piece of machinery in that line which they had ever seen.

At Pittsbugh much interest was excited by the common use in the rolling mills of the rotary squeezer for shingling puddle balls, of which Wharton McKnight is a conspicuous maker. The rotary squeezer is not known in Germany, France or Belgium. Its introduction was attempted in 1855 or 1856, but with unsatisfactory results, and it was then abandoned. In these countries all shingling is done with a hammer.

In a number of shops were seen high speed traveling cranes, for handling large masses, manufactured by William Sellers & Co., of Philadelphia, and the Morgan Engineering Company, of Alliance, Ohio, which were extremely interesting.

William Sellers & Co., of Philadelphia, have an admirable self-acting punching machine in the Keystone Bridge Works, at Pittsburgh. This machine needs no draftsman to lay out work for it, but only common workmen.

In Park, Bro. & Co.'s steel works, at Pittsburgh, saw a rotary shear making cylinders, manufactured by Samuel Trethewey, of Pittsburgh.

At Chicago the construction of the new Massick & Crooke's fire brick stoves, by the Illinois Steel Company, was specially noticeable. Very nice work was being done by the mechanics employed. The use of iron and steel in the construction of Chicago buildings was exceedingly interesting. C. L. Strobel, of the Keystone Bridge Works, described a building now under way, which is to be 216 feet high and to have 16 stories. The foundations consist of I beams 20 inches wide, laid in cement, on top of which is placed a cast iron base for the columns.

The elevating machinery at the blast furnaces of the Illinois Steel Company was quite novel. The Crane Elevator Company's hoist is employed. For the same character of work abroad the engines used would be three or four times as heavy.

A small shear, well gotten up by James Scheriffs, of Milwaukee, Wis., was seen in the machine shop at the Chapin Mine, Iron Mountain, Mich.

The copper district in Michigan abounded in machinery and appliances of an interesting character. The equipment of the Calumet and Hecla mines surpassed anything ever seen abroad. A peculiar form of boiler is in use, some of which were built by the Dickson Mfg. Company, of Scranton, Pa., and some by the Southwork Foundry and Machine Company, of Philadelphia. It is a flue boiler, of remarkable capacity for raising steam. Another boiler of excellent type was made by E. P. Allis & Co., of Milwaukee, under Reynolds' patents. A condenser patented by Reynolds and built by the same parties had some interesting features. A remarkable drum, also designed by Reynolds, is is use hoisting a load of 4 tons 2500 feet. This drum is very light for its size. Its diameter is 30½ feet, and it is 11 feet wide. The weight of the drum was originally 140 tons, but it was reduced to 80 tons by the substitution of steel for cast iron in a part of its construction. The spokes are all made of steel tubes. It operates with a double rope, one winding at the top and the other on the bottom of the drum, so that it hoists and lowers a cage at the same time. A Dickson Mfg. Company's engine seen here seems especially good for heavy work. It is of the compound type, and will exert 2000 horse-power or over. A new vertical boiler, built by the Eagle Iron Works, of Detroit, was seen at the Tamarack Mine.

S. E. Cleaves, of Hancock, Mich., has a new machine for washing ore, which is of nice construction and works well.

The miners employed in the Michigan copper mines have a very commendable beneficial association. They pay $3 per year dues, and receive $22 per month when ill or disabled, while $500 is paid to a man's family in case of death. Such associations should be encouraged.

On visiting the great Lake Superior iron ore regions it is found that this high grade ore costs no more delivered at the furnace, per ton of iron made, than the 35 per cent. ore used in the German basic steel works, although the latter is mined not far from the furnaces.

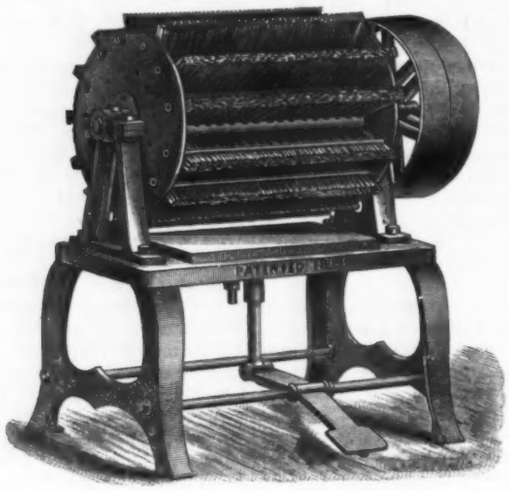
Arrangements are making for the laying of a double pneumatic tube line between New York and Philadelphia. Between these two and all intermediate points it is expected that letters, newspapers and small packages will be whirled at the rate of 4 miles a minute. S. F. Leake, of Philadelphia, claims to have discovered all the essentials to this great undertaking—namely, a practical switching system for intermediate ponts, a long distance carrier that will not heat by friction, ability to stop the same without serious shock or injury, and very rapid transmission of messages, &c., without even a liability to accident. His carriers will run on wheels whose axles will revolve in a journal of asbestos and plumbago. The carriers will be automatically stopped by compressed air, and he will be able, he says, by means of a block system to make a switch or a station at any point on the line. To test the practicability of the system a tube line will shortly be laid between Jersey City and Newark.

The Illinios Steel Company paid their Joliet workmen the second quarterly dividend on the 27th ult., in accordance with the profit sharing plan recently adopted. The dividend just paid amounted to over $4000, and the recipients were naturally highly pleased with the arrangement. It appears to be working very well and must certainly promote a cordial understanding between the workmen and their employers.

The Texas State Fair, at Dallas, affords an unusual exhibition of farm implements and labor saving machinery, in addition to other attractions. Many of the principal American manufacturers are represented. A tricycle sulky plow, from Canton, Ill., moved by electricity, is spoken of as something very remarkable and greatly admired.

Rotary Steel Wire Brushes.

After many experiments with rotary brushes, J. W. Paxson & Co., of Philadelphia, discovered that the action upon the steel wires at their base caused them to harden at that point and break off, no matter how nicely the wire might be tempered. If there was much speed or motion of the brush, the wires would fly, and the brush would not last long enough to guarantee refilling. This trouble has been overcome by introducing bars from two cylinder heads close to each row of bristles,



ROTARY STEEL WIRE CLEANING BRUSH.

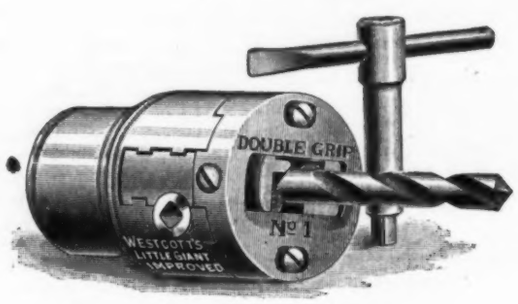
midway between the end of the wires and their base, for a support for the bristles when in service, as shown in the accompanying engraving. This so completely relieves the action at the base of the wires that a brush which, as formerly made, would not last a week, now lasts from four to six months continuous service, cleaning sheet metal. The horizontal rods are adjustable, and can be lowered when the ends of the bristles are worn off. There is very little wear upon the cylinder and frame of the brush, so that when the wires are worn down refilling makes it as good as new. The Cramp shipyards, of Philadelphia, have been using these brushes for a year past, for the purpose of removing scale and impurities from the steel plates used in constructing their large ships. These brushes are made any desired length and diameter, and with or without the adjustable frame.

A double propeller ferry boat was launched from Neafie & Levy's shipyard last week for the New York, Lake Erie and Western Railroad Company. While one screw is pulling the other is pushing the vessel through the water. The ferry boat Bergen, of the Hoboken line, is propelled on this plan with satisfaction.

In reply to persons in Colorado who contemplate the erection of a large steel and iron plant in western Washington, W. E. Everette, geologist and assayer, of Tacoma, writes that "in the results of several hundred analyses of our Puget Sound iron ores, I find that the average of these analyses will approximate safely about as follows: For hematite and somewhat higher in iron, for magnetite, metallic iron, 55 per cent.; silica, 7 per cent.; phosphorus, 0.04 to 0.30 per cent.; sulphur, 0.05 to 1.02 per cent. Hand picked samples will run as high as 66 per cent. of iron, and in one instance I obtnined 69.32 per cent. out of a possible 70.00 per cent. from an almost pure hematite found back of Lake Washington, near the city of Seattle." Puget Sound and the country adjacent to it has large deposits of every grade of lignite and bituminous coals.

Double Grip Drill Chuck.

While many machinists demand a drill chuck with the grip so strong that the drill will break before it will slip, others prefer the drill to slip before breaking. These differing demands have been satisfied in the new Double Grip Chuck here illustrated, and which is manufactured by the Westcott Chuck Company, of Oneida, N. Y. This end is obtained by putting on a drop forged steel tie plate, that acts not only as a clamp, but, having flanges, makes of it a tie plate, thus rendering it an impossibility to spread or spring the chuck body, as in other chucks of the same construction. This tie plate or extra stay applied to the back of the jaws is independent of their other adjustment. This is accomplished by the plate having lateral motion across the face of the chuck



DOUBLE GRIP DRILL CHUCK.

body, thereby doing away with the liability of throwing drills or work out of true. It is stated that this chuck will be found particularly serviceable on bolt cutting machines and on screw machines for holding iron to be threaded with a die, or for any work where a chuck of extra strength is needed, as well as for the many uses required of a drill chuck. It can be employed in the ordinary way without using the tie plate. When used for extra heavy work, the chuck is centered in the usual way, and then by setting up the set screws in the tie plate it will, it is claimed, have many times the holding power of any chuck manufactured. The set screws in the tie plate are made for screw driver and not to project, but if desired are made with a square head and to project. By the use of the tie plate there is no danger of injuring the chuck or straining the screw operating the jaws. The chuck is made with diagonal jaws or with regular straight jaws.

SOUTHERN MISCELLANY.

The Alabama Pipe Works Company are a new $100,000 enterprise at Bessemer, Ala., of whom F. H. West, of Bessemer; D. McK. Sinclair, and A. F. Bridge, Whitewater, Wis., and others are incorporators.

A plant will be established for the manufacture of soil pipe, wrought iron ware and plumbers' supplies.

A company is organizing at West Point, Ga., with a capital stock of $20,000, to establish an iron works.

The Hampden Iron Works of the Robert Poole & Son Company, Hampden, Md., are doubling their capacity.

New York parties have purchased the holdings of the Stevenson Land Company, at Stevenson, Ala., consisting of 2000 acres of iron and 5000 acres of coal lands. The company will undergo an entire reorganization and the property will be vigorously developed.

The Canton Iron Company have been incorporated at Chattanooga, Tenn., by H. S. Chamberlain, Ewell Eastman, O. L. Hurlbut and others. The purposes of their organization are the erection at Canton, Ga., of iron furnaces and iron working plants, and the development of valuable ore properties. Work of constructing the furnace will begin shortly.

The Cumberland Steel Company have been incorporated by A. H. Hicks, W. C. Dickey and P. B. Sidell, of Philadelphia, Pa. These are the parties who recently purchased the steel plant, rolling mill, machinery, &c., of the Crown and Cumberland Steel Company, at Cumberland, Md.

The iron ore properties near Cedartown, Ga., belonging to the Georgia and Alabama Consolidated Mining Company are reported to have been recently sold to the Augusta Mining Company for $300,000. The new owners propose erecting improved mining machinery and will develop the property extensively.

Col. H. I. Kimball, the progressive spirit of the new Tennessee town of Kimball, is now in England, from where comes the information that he has successfully terminated negotiations for the establishment of a large steel plant with English money.

A large foundry will be establishd in Atlanta, Ga., by the Westerland Electric Conduit Company, recently incorporated, with a capital stock of $600,000. The offiers of this company are J. W. Stephens, president; Aleck Beck, vice-president; J. W. Jones, secretary and treasurer, with the directors as follows: All of the above and T. L. Langston, Burton Smith, Albert Howell, Jr., H. I. Zachry, J. W. Jones, W. H. Patterson and W. T. Gentry.

Car wheel works are being erected at Jefferson, Texas, by the Lone Star Iron Company.

The Beaver Tube Company, with a capital stock of $1,000,000, have been incorporated at Wheeling, W. Va.

E. M. Irvine will move his iron works from Grand Haven, Mich, to Aberdeen, Miss., if the citizens of that place will co-operate with him in the organization of a $50,000 stock company.

Anderson & Farnsworth, Bristol, Tenn., have purchased the building formerly occupied

by the Bristol Woolen Mills, and will arrange it for a foundry and machine shop. They will make a specialty of manufacturing grist mill machinery, turbines, clutch pulleys and other like machinery.

Parties are making an effort at Wilmington, N. C., to establish a rolling mill.

The Birmingham Agricultural Works are preparing to increase their capacity considerably by the addition of new machinery for the manufacture of all kinds of agricultural implements.

The Gibson Plow Works, of Chattanooga, Tenn., are behind their orders.

The Excelsior Machine Works, at Wheeling, W. Va., are building a new machine shop 40 x 90 feet.

In order to keep pace with orders the Chicamauga Foundry and Machine Shops, of Chattanooga, Tenn., have been compelled to run 15 hours a day.

The Chattanooga Furnace is preparing to blow out to undergo necessary repairs. This plant has been turning out 60 tons of pig iron per day.

The George E. Wheeler Company have been organized at Piedmont, Ala., for the purpose of manufacturing covering for boilers, steam pipes, drums, chests, &c.

The Southern Iron Company, Chattanooga, Tenn., have recently given the South Pittsburg Iron Furnace, South Pittsburg, Tenn., an order for 5000 tons basic pig, to be used in the new steel plant of the Southern company.

A New York syndicate, composed of S. T. Woodward and others, propose erecting a $400,000 steel plant in Birmingham, Ala. The Elyton Land Company will take $50,000 worth of the stock to induce the location of the industry.

The work of constructing the new steel plant at Ashland, Ky., has begun, and will be pushed forward with all possible speed.

A car wheel works is to be erected at Middlesborough, Ky., by the Griffin Car Wheel Works, of Buffalo, N. Y.

A structural iron manufacturing concern, with a capital stock of $5,000,000, is reported to have moved from England to Middlesborough, Ky.

Production of Steel.*

BY DR. WILLIAM M. SWEET.

The total production of steel in the United States in the form of ingots or direct castings during the year ended June 30, 1890, amounted to 4,466,926 tons of 2000 pounds, as compared with 1,145,711 tons produced during the year ended May 31, 1880, an increase of 3,321,215 tons, or 290 per cent.

The following table gives the production of the various kinds of steel in the form of ingots or direct castings in 1880 and 1890. The statistics for 1880 are for the census year ended May 31, 1880, but for 1890 they cover the fiscal year ended June 30, 1890. A few steel works produce blister, cemented and other miscellaneous steel, but the quantity made annually is very small, and the statistics thereof for 1880 and 1890 are not included in the table below:

Kinds of steel. (Ingots or direct castings.)	Tons of 2000 pounds.	
	Year ended May 31, 1880.	Year ended June 30, 1890.
Bessemer steel	985,208	3,788,572
Open hearth steel	84,302	504,351
Crucible steel	76,201	85,536
Clapp-Griffiths steel	.....	83,963
Robert-Bessemer steel	.....	5,504
Total	1,145,711	4,466,926

During 1880 14 States contained steel making establishments, and steel was produced in that year in each of these States except Rhode Island and Maryland. In 1890 steel works were located in 19 States, and steel was made in that year in each of these States except Kentucky, Missouri, and Virginia.

Pennsylvania continues to occupy the position of the leading producer of steel in the United States, producing 57 per cent. of the total production in 1880 and 62 per cent. in 1890. Illinois was second in rank in both years, and Ohio was third. From 1880 to 1890 the increase in production in Pennsylvania was 324 per cent., in Illinois 241 per cent. and in Ohio 314 per cent. Since 1880 the manufacture of steel has been abandoned in two States—viz., Rhode Island and Vermont—and seven States have engaged in its production—viz., Alabama, California, Colorado, Indiana, Michigan, Virginia and West Virginia.

The following table gives, in tons of 2000 pounds, the total production, by States, of Bessemer, Clapp-Griffiths, Robert-Bessemer, open hearth, and crucible steel, in the form of ingots or direct castings, during 1890, with the number of completed steel works at the close of each year, the relative rank of each State and the percentage of the total production:

Rank.	States.	Year ending June 30, 1890.		
		Number of steel works. (a)	Production of all kinds of steel. Tons of 2000 pounds.	Percentage of total production.
1	Pennsylvania	79	2,768,253	61.97
2	Illinois	14	868,250	19.44
3	Ohio	18	446,808	10.00
4	West Virginia	2	183,225	4.10
5	New York	8	113,499	2.54
6	Massachusetts	6	30,252	1.95
7	New Jersey	8	17,999	
8	Colorado	1	17,952	
9	California	1	6,904	
10	Michigan	2	5,600	
11	N. Hampshire	1	3,700	
12	Connecticut	3	1,734	
13	Indiana	6	1,350	
14	Maryland	1	1,000	
15	Alabama	1	300	
16	Tennessee	4	100	
17	Virginia	1	.....	.....
18	Kentucky	1	.....	.....
19	Missouri	1	.....	.....
	Total	158	4,466,926	100.00

a Each Bessemer, open hearth and crucible steel plant is counted as separate works, although two or more of these plants are frequently embraced in a single establishment.

BESSEMER STEEL.

The production of Bessemer steel ingots or direct castings in the United States during 1890, including steel made by the Clapp-Griffiths and Robert-Bessemer processes, amounted to 3,877,039 tons of 2000 pounds, an increase of 294 per cent. over the production of 985,208 tons in 1880. In 1880 there were 11 completed works in this country for the production of Bessemer steel ingots or direct castings, which were located in Illinois, Missouri, New York, Ohio and Pennsylvania, while at the close of 1890 the number of establishments containing Bessemer converters, including the works prepared to manufacture Clapp-Griffiths and Robert-Bessemer steel, had increased to 53, located in Colorado, Illinois, Indiana, Massachusetts, Michigan, Missouri, New York, Ohio, Pennsylvania, Tennessee, Virginia and West Virginia.

Of the production of 985,208 tons of Bessemer steel ingots or direct castings in 1880 Pennsylvania produced 56 per cent., and New York and Ohio each over 8 per cent. Of the production of 3,877,039 tons of Bessemer steel ingots or direct castings in 1890, including that made by the Clapp-Griffiths and Robert-Bessemer steel works, Pennsylvania produced 59 per cent., Illinois 22 per cent., Ohio nearly 10 per cent., West Virginia 5 per cent., New York over 2 per cent, and Colorado, Massachusetts and Michigan each less than 1 per cent.

The Clapp-Griffiths and Robert-Bessemer processes were introduced into the United States during the past decade, the former from Great Britain in 1884 and the latter from France in 1888. Both processes are modifications of the ordinary Bessemer method, but the converters employed are nearly all of small capacity. The first steel made in this country by the Clapp-Griffiths process was produced at Pittsburgh, Pa., March 25, 1884. During 1890 seven works contained converters for the production of steel by this process, five of which were in operation in that year, producing 83,963 tons of steel ingots or direct castings. No new plants have been erected since 1887, and none are now under construction. The first steel produced in this country by the Robert-Bessemer process was made at experimental works at Springfield, Ohio, in September, 1888. During 1890 there were six completed works containing converters for the production of steel by this process, and one plant was in course of erection. The process may be said to be still in an experimental stage, but the results that have so far been obtained by its use are reported to be encouraging. During 1890 there were 4504 tons of Robert-Bessemer steel produced in this country, principally in the form of castings.

The following table gives in tons of 2000 pounds the production of Bessemer steel ingots or direct castings (the figures for 1890 including the quantity of steel made by the Clapp-Griffiths and Robert Bessemer processes) and Bessemer steel rails in the United States in 1880 and 1890:

States.	Bessemer steel ingots or direct castings. (Including Clapp-Griffiths and Robert Bessemer steel).		Bessemer steel rails.	
	Year ended May 31, 1880.	Year ended June 30, 1890.	Year ended May 31, 1880.	Year ended June 30, 1890.
California	.....	.....	.....	5,654
Colorado	.....	17,952	.....	14,286
Illinois	253,514	867,805	201,186	622,260
Indiana	.....	.....	.....	.....
Massachusetts	.....	15,753	.....	.....
Michigan	.....	3,600	.....	.....
Missouri	8,409	.....	5,100	.....
New York	84,160	105,402	57,870	.....
Ohio	82,811	385,576	64,480	17,335
Pennsylvania	556,314	2,297,726	409,330	1,377.119
Tennessee	.....	.....	.....	.....
Virginia	.....	.....	.....	.....
Vermont	.....	.....	1,500	.....
West Virginia	.....	183,225	.....	.....
Total	985,208	3,877,039	741,475	2,036,654

The remarkable growth that has taken place in the Bessemer steel industry of this country during the past ten years is well shown by the above figures. The increase in the number of establishments producing Bessemer steel has been the result almost entirely of the demand for steel in forms other than rails. All of the 11 Bessemer steel plants that were completed in 1880 had been built to manufacture steel for rails, many of them being added to previously existing iron rail mills. Of the 53 Bessemer steel plants at the close of 1890 only 14 made steel rails during that year, and of the total quantity of rails produced over 90 per cent. was made by ten of these works. Thus, while the production of steel rails has nearly trebled in amount since 1880, the number of establishments engaged in their manufacture has shown but little change in the ten years, although many of these works have greatly increased in size and efficiency. The competition in the manu-

* Preliminary Report of the Census Office.

facture of Bessemer steel rails has compelled many of the rail mills to convert a large part of the steel produced by them into forms other than rails, the production of rails to any considerable extent at the present time being possible only in works favorably located for the supply of cheap raw materials and operated under the latest and most improved methods of manufacture. Included in the total production of Bessemer steel rails during 1890 were 65,273 tons rolled in iron rolling mills from purchased Bessemer steel blooms.

While the demand for steel rails has shown a remarkable growth since 1880, thereby forcing a practical discontinuance of the manufacture of iron rails, there has also been a rapidly increasing use of steel for nails, bars, rods, wire and other miscellaneous forms. The growth of the Bessemer steel industry in this direction is clearly shown in the number of plants that have been added to iron rolling mills during the past ten years for the purpose of manufacturing steel in forms other than rails. The increased quantity of Bessemer steel manufactured in these miscellaneous forms is approximately shown by a comparison of the ingots and rails produced, over 75 per cent. of the ingots made in 1880 being converted into rails, while in 1890 the percentage of rails made to ingots produced was only 53 per cent.

OPEN HEARTH AND CRUCIBLE STEEL.

The production of open hearth steel in the form of ingots or direct castings during 1890 amounted to 504,351 tons of 2000 pounds, as compared with 84,302 tons made during 1880. In 1880 there were 25 establishments containing open hearth steel plants, located in ten States, and in 1890 there were 58 establishments containing open hearth steel plants, located in 12 States. Since 1880 the manufacture of open hearth steel has been abandoned in two States—Vermont and Rhode Island—and four States have engaged in its manufacture—New York, Alabama, Indiana and California. During the past few years great activity has taken place in the erection of open hearth steel plants, and indications point to a still larger production of this kind of steel during the next few years.

The following table gives, by States, the production of open hearth and crucible steel in the form of ingots or direct castings, in 1880 and 1890, in tons of 2000 pounds:

States.	Open hearth steel ingots or direct castings. (Tons of 2000 pounds.)		Crucible steel ingots or direct castings. (Tons of 2000 pounds.)	
	Year ended May 31, 1890.	Year ended June 30, 1890.	Year ended May 31, 1880.	Year ended June 30, 1890.
Alabama	.....	300	.....	.....
California	.....	6,904	.....	.....
Connecticut	.....	.....	2,116	1,734
Illinois	925	.....	130	445
Indiana	...	1,000	.....	350
Kentucky	275	...	75	.....
Maryland	.....	.....	.....	1,000
Massachusetts	9,475	13,967	146	532
Michigan	.....	.....	.....	2,000
New Hampshire	4,521	3,700	.....	.....
New Jersey	450	9,956	10,492	8,343
New York	.....	1,300	2,585	6,797
Ohio	24,712	61,382	360	.....
Pennsylvania	36,944	406,292	60,303	64,235
Tennessee	4,000	.....	.....	100
Vermont	3,000	.....	.....	.....
Total	84,302	504,351	76,201	85,536

The crucible steel industry has shown but little progress since 1880, the production in that year amounting to 76,201 tons of 2000 pounds, as compared with 85,536 tons produced in 1890. In 1880 there were 36 establishments containing crucible steel plants, located in nine States, while in 1890 the number of establishments had increased to 47, located in 11 States. For purposes requiring special grades of steel the product of the crucible process will be always in demand, but the high cost of manufacture prevents it in many instances from successfully competing in price with the other processes mentioned.

THE BASIC PROCESS.

The first basic steel made in the United States was produced experimentally at Steelton, Pa., by the Pennsylvania Steel Company on May 24, 1884, in a Bessemer converter. The beginning of the manufacture of basic steel in this country as a commercial product, however, dates from 1888, on March 28 of which year the first basic open hearth steel was produced at the Homestead Steel Works of Carnegie, Phipps & Co., Limited, at Homestead, near Pittsburgh, Pa. Since that date the manufacture of basic open hearth steel has been continued at these works, and during 1890 this firm commenced the erection of eight additional open hearth furnaces for the manufacture of basic steel, of which number four are now in operation and the remaining four furnaces are expected to be ready for working in a short time. When completed these works will contain 16 open hearth furnaces prepared to manufacture basic steel. The manufacture of basic steel is now also regularly carried on at the Steelton works of the Pennsylvania Steel Company, where a combination of the Bessemer and open hearth processes is used. During 1890 the Henderson Steel and Mfg. Company, at Birmingham, Ala., produced steel experimentally by the basic process. Since the close of the year the Southern Iron Company have successfully commenced the manufacture of basic open hearth steel at their works at Chattanooga, Tenn. The Pottstown Iron Company, at Pottstown, Pa., have also produced steel by the basic process.

In Great Britain and on the Continent the basic process has been received with great favor, and large quantities of basic steel are made annually by all the leading iron and steel producing countries abroad. The wonderful growth of the steel industry of Germany and Luxemburg during recent years has followed the introduction of this process, the iron ores of these countries being especially suited to the manufacture of basic steel.

While the basic process is applicable to either the Bessemer or open hearth process, its use in this country in connection with the open hearth furnace is most promising of successful results, and the indications are that the growth of the basic steel industry of the United States will be largely in this direction. The total production of basic steel in the United States during 1890 amounted to 62,173 tons of 2000 pounds, nearly all of which was made by the basic open hearth method, a small part being produced by the duplex process, a combination of the Bessemer and open hearth methods.

An Intercontinental Railway.—The commissioners appointed to consider the most feasible plan for a grand trunk railroad to connect the Northern and Southern continents of America are about to assemble in Washington. The chief questions in regard to this project are of a political and financial rather than of a physical character. How to connect the scattered lines of railway operating within different States and weld them into a continuous chain, reconcile international jealousies, obtain government concessions and grants of way, and suppress the promptings of greed among North American and South American politicians and jobbers who will be eager to avail themselves of such an opportunity for plunder—these are matters which will give the commissioners more trouble than the engineering aspects of the undertaking. As to the prospects of financial success it will not do to indulge in extravagent anticipations. Long stretches of the road will extend through uncultivated and unproductive regions which for the present will afford small return for the immense outlay.

The Boiler Manufacturers.

James Lappan, president of the American Boiler Manufacturers' Association, recently addressed the following letter to the firms engaged in the manufacture of boilers in the United States and Canada:

I desire to call your attention to a few of the many advantages to be gained by joining and encouraging our association. There are very few industries that are not organized for advancement and protection, as all have learned that it is now absolutely necessary to combine in order to prevent the suicidal policy of cutting prices and driving each other to the wall, and at last bringing destruction upon all concerned. At the present time there is no line of business wherein this policy is practiced more than in ours. The largest shops with the greatest amount of capital are taking work at cost prices and depriving their neighboring shops of an opportunity to make the smallest profit out of even a share of the work in the market, when all might as well have a fair price for good work. It is folly for any one or two shops in the same locality to endeavor to secure all the work required, for others are sure to get a part, even if compelled to cut the price and slight the work. Now, the quality of the work produced is not improved by this method of doing business. The tendency is to use cheap material, insufficient and fewer braces, and to employ unskilled mechanics, which frequently necessitates either having the work done over that it may pass inspection or having it returned. This causes reflections to be cast upon us as mechanics and business men, and works great injury by creating a lack of confidence in us and in engendering revengeful feelings among ourselves. Be it also remembered that some of us have powerful and often unreasonable organizations to combat; namely, labor unions, which at present are formidable and troublesome, lacking universality and causing local embarrassment by unreasonable demands. These organizations care nothing about our many embarassments, which are often occasioned by the negligence of their members. They demand the full pound of flesh whether their work is satisfactory or not. They never confront the patron, and if their work is not right we get the blame and must stand all the responsibility and loss. This question requires full and serious consideration.

Another injurious and demoralizing method of conducting our business is through supply agencies, or what are called middlemen, who have not a dollar invested in the manufacture of boilers, nor a tool of any description in use. They have active agents everywhere who procure orders and then go from shop to shop with promise of patronage and often succeed in getting the work done at prices below the cost of labor alone. The writer can say from personal knowledge that a certain supply company hauls more boilers past his place every day than his shops could turn out, and the whole business is conducted in a small down town office by a few clerks. Now, the middlemen are getting rich while we, who do the hard work, must be content with a bare livelihood. I have received many letters from all parts of the country, complaining about the condition of our business, on account of the cheap, worthless and dangerous boilers sent out by agencies. Many other instances might be noted but I think the

above sufficient to call your attention to the need of a speedy and effectual improvement in the business. We should try to help ourselves before it is too late, and not sit idly by and see the fruits of our hard labors in the past gradually disappear. I am sure that all this and more can be accomplished by thorough organization and confident reliance upon each other.

Therefore, with one object in view, I hope that all those who have not yet joined our association will unite with those who have, and come to our meetings, help us with good examples and give us the benefit of experience and skill on all questions to be considered. Let us resolve that we will turn out only first-class work and thus regain our somewhat lost reputation. Let us keep others from monopolizing the profits of our labors, and reserve for ouselves the rewards to which we are justly entitled. I hope that every manufacturer, no matter how small his business, will realize the benefits to be derived from joining the A. B. M. A. and helping us in our endeavors to elevate the business. According to our constitution we must organize State and local boards, appoint committees, refer all questions to the proper authorities, confer with neighboring States and localities, submit to all rules adopted, and under no circumstances depart therefrom. When this is done and we have a strict adherence to and observance of the rules in every case, a far better condition of trade will quickly follow, confidence will be restored, and customers will be willing to pay better prices.

The Radford Pipe and Foundry Company.

The Radford Pipe and Foundry Company were organized October 4, 1890, at Cincinnati, under the laws of Ohio. The general office is located at Cincinnati, and works are building at Radford, Va. The capital stock of the company is $350,000; $300,000 paid in. The directors of the company are James N. Gamble, W. F. Doepke, J. A. Crawford, Archer Brown and J. K. Duirmick, of Cincinnati, and James I. Doran, and W. C. De Armond, of Philadelphia, Pa. Mr. Gamble is one of the managing directors of the Proctor & Gamble Company, and builder of Ivorydale. All the other directors are also men of prominence. Mr. Doepke is a member of the Alms & Doepke Company, one of Cincinnati's largest dry goods establishments; J. A. Crawford, a retired banker; James I. Doran, general counsel for the Norfolk and Western Railroad, and representative of two large English syndicates; Archer Brown, the managing member of the firm of Rogers, Brown & Co., the largest distributors of pig iron in the West; and Mr. De Armond is the purchasing agent of the Norfolk and Western Railroad. J. K. Dimmick, the general manager of the foundry, is the builder and manager of the Addyston plant, as well as the founder of the Newport works. The officers of the company are as follows: James N. Gamble, president; W. C. De Armond, vice-president; Archer Brown, secretary and treasurer; J. K. Dimmick, general manager, and W. T. Partridge, assistant to the president.

Radford, the seat of the new industry, is located on the Norfolk and Western Railroad, in Montgomery County, in Southwestern Virginia. The river runs in front of the town, and the surrounding territory is rich in iron, coal and limestone. The rail lines, which carry Pocahontas coke to the seaboard and iron ore from Cripple Creek to the many furnaces in the neighborhood, meet at Radford. These natural advantages are alluded to as insuring the manufacture of pipe and castings at minimum cost, while direct rail connection with the Atlantic coast, the South and the Northwest opens all desirable markets for the distribution of the finished product of the plant. The special foundry will be in operation by the first of the year, and the pipe foundry will be finished about May, 1891. Contracts are now being let, and all speed exercised in the erection of the works.

A New Meat-Packing City.

It is authoritatively announced that the three great meat packing firms of Chicago, headed respectively by Armour, Morris and Swift, have purchased 3630 acreas of land in Lake County, Ind., on which they intend to establish stock yards and meat packing establishments of greater magnitude than their present enterprises. Their plans contemplate the establishment of a city in itself, as the business controlled by these three concerns alone is almost fabulous in extent. The firm of Armour & Co. alone transacted a business last year of $60,000,000. It is estimated that the three houses named have an annual trade aggregating $150,000,000. The land which they have purchased lies 23 miles southeast of Chicago's court house. It fronts four miles on Lake Michigan and eight miles on the Grand Calumet River, which runs through it for its entire extent. The Baltimore and Ohio and the Michigan Southern Roads run through it, while at Tolleston, adjoining it on the south, is the junction of the Fort Wayne and the Michigan Central roads. The river averages a width from bank to bank of one quarter of a mile, is called by the Government a navigable stream, can be dredged with little expense, and now is from 6 to 10 feet in depth. The land lies from 10 to 15 feet above the level of the lake and river, affording easy drainage. The ground is covered with a growth of oak. The location is ideal in many respects. The climate is equable, extremes of heat and cold being less than in Chicago, and the location is remote from disturbances in the event of labor troubles. Another point of importance is that hundreds of thousands of cheap acres are contiguous to the tract, allowing opportunity to expand in all directions.

The first improvement will be the cutting of a canal from the Calumet River to the lake. This will be made a navigable, private waterway, one-third of a mile long and 100 feet wide. Coincident with this will be the widening and deepening of the river to provide provisions for private dockage for lake craft on lake, canal and river. To protect the harbor thus to be formed a pier will be run out from the embouchure of the canal on the lake. This will be a substantial improvement. The mouth of the canal will be made wide enough to provide a harbor easy of access to lake craft not only when the needs of commerce demand, but when stress of weather prevails. The importance of a safe harbor at this point is manifest when it is remembered that Indiana has only one harbor on Lake Michigan—that of Michigan City—and the loss by wreckage on the coast is enormous. A large town site will be established in about the center of the tract. This will be of sufficient size to accommodate the thousands of workmen whose homes will be transferred to the Indiana location. Within five years it is estimated that the population of this district will be 150,000.

The Pacific Mail Steamship Company are building two new vessels of 2000 tons each, to accommodate the trade along the north coasts of Central America and South America, connecting three times a month at Aspinwall with the company's steamers from New York. This business has heretofore been done entirely by foreign vessels. Statistics prepared by the Pacific Mail Company within the last three months show that Europo, 4000 miles away, is doing 75 per cent. of the trade with the northern ports of Central and South America, while New York, less than 1000 miles away, is doing but 25 per cent. Officers of the company declare that in a short time after the reciprocity treaties, now being drawn up, go into effect this percentage of business will be reversed in favor of New York.

NEW ENGLAND ITEMS.

The Corliss Safe and Vault Door Mfg. Company, of Providence, have shipped one of their 36-inch safes, weighing 11,500 pounds, to the Wakefield, R. I., Institution of Savings.

The Fitchburg Steam Engine Company, of Fitchburg, Mass., have recently received, through their Philadelphia representative, G. H. Connor, Builders' Exchange, the following orders: Complete steam plant for the Suburban Electric Light Company, Tacony, Pa., for two 400 horse-power compound condensing slow speed engines, boilers, pumps, &c.; plant for the Powelton Electric Company, Philadelphia, for two 250 horse-power compound condensing slow speed engines, pumps, &c., one 250 horse-power engine for the Frog Moor Mills, Franklin, Pa.; engine, &c., Jacob Miller, Sons & Co., Bordentown, N. J.; two engines, boilers, bleach, &c., for paper mill of T. S. Marshall & Sons, Yorklyn, Del. They are also building a large compound condensing engine for the Quincy Market Cold Storage Company, Boston, also for Clinton Electric Light Company, Morgan Envelope Company, Springfield; Farley Paper Company, Erving; Boston Rubber Shoe Company, Boston; Meriden Britannia Company, and C. Parker Company, Meriden, Conn.: Crosby Steam Guage Company, Boston; also a complete plant for a large brick company in Georgia. They are just starting an engine for the Princeton, N. J., Electric Light Company. They have received through their agents, Kimball & Teal, orders for 100 horse-power, 80 horse-power and 75 horse power engines for Chicago; also one 100 horse-power engine for the Geneseo, Ill., Electric Light Company. They are building the fourth engine for the large paper mill of P. H. Glatfelter, Spring Grove, Pa. The company have just completed a large plant for the United States Government, at the Watervliet Arsenal, Troy, N. Y. The company will soon double their capacity.

A new industry has been obtained for the town of Keene, N. H. It is to manufacture artificial granite. The company are engaged seeking a suitable location upon which they can erect desirable buildings. They have planned for a main factory 132 x 30 feet and two stories high, with kilns, engine room, stock shed, furnace shed, &c., adjoining. Efforts will be made to have the property exempt from taxation. Just as soon as it is practicable the work of erecting the buildings will be commenced.

The Bristol Electric Light Company are making arrangements to enlarge their plant by adding a new engine of 130 horse-power, and a new dynamo which will run 1300 incandescent lights of 16 candle power. With their present capacity the company will have engines of 220 horse-power and 2000 incandescent lights, besides the dynamo which runs the large circuit of arc lights.

A company has been organized on a large scale in Brazil, to be known as the Union of Industry, for the purpose of manufacturing almost everything known in the trade. A represenative of the company, Señor Jordao, of Rio de Janeiro, is now in the United States to purchase the necessary machinery, including a sawmill, steam laundry and paper mill. Referring to his recent investigations in Europe, he said: "I found that American machinery is superior to anything made in Europe. I visited Germany, France, Belgium and England. I found the price of European machinery a little lower, but the American machines are so much more labor saving that I find them more desirable for our use, and I shall make my purchases in this country almost entirely." Mr. Jardao believes that Brazil is destined to have a brilliant future, and that hereafter the United States will receive a larger portion of her trade

Modern Blast Furnace Construction.—III.

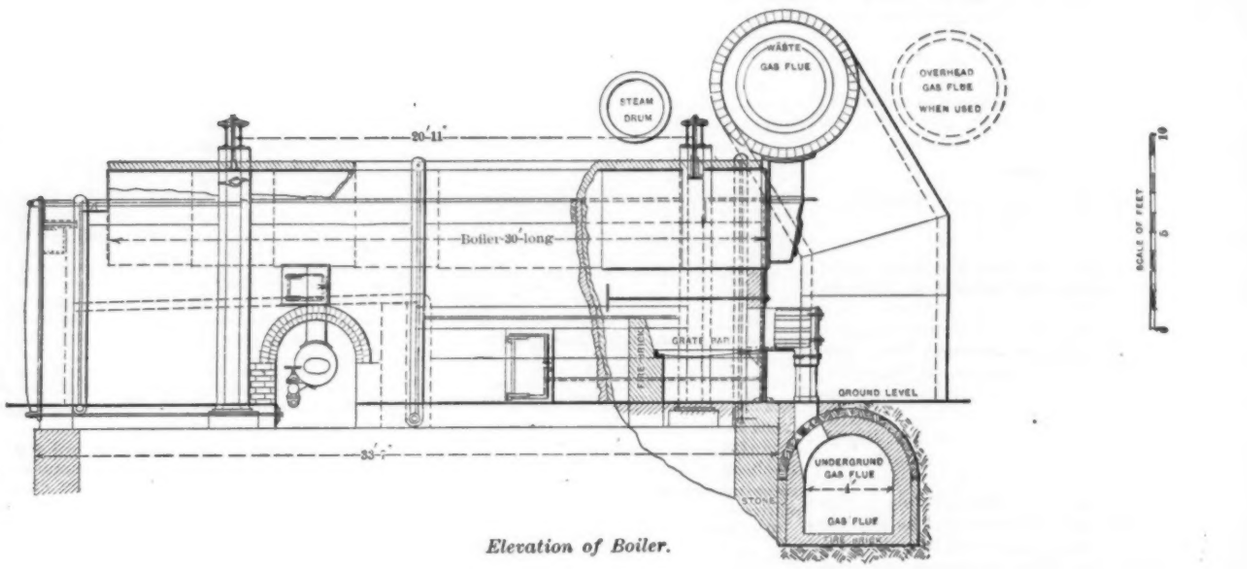
JAS. L. WHITE, PITTSBURGH, PA.

(Continued from Page 448, September 18.)

The tube leading from the dust catcher to the valves admitting the gas to the stoves is taken out at similar point, but on the side toward the stoves, and in this case to supply two stoves at once, will be 42 inches inside diameter of shell, and lined also with 4½-inch side arch bricks. Downtakes to the three stoves will be 30 inches diameter of shell; also lined with 4½-inch bricks, but these should be circle brick. Some prefer to use circle brick all through the flue linings, but they are not quite so easily laid, and openings in horizontal tubes at explosion doors are not so well protected, circle brick laid on the side being apt to fall out. Neither can they be well build without a center, as the side arch can, especially easily in curving parts of tubes, such as the bustle pipe.

It should be remarked here that a furnace should be planned as to obtain nearest the furnace stack toward the draft stack, having three cleaning door frames about 4 feet square, set in the arched top of the flue at convenient distances apart. After leaving the last stove the flue curves toward the draft stack so as to enter between two of the foundation bolts, then it begins to slope upward in the roof to give an easy passage to the spent gas entering the stack. In general the flue enters the stack foundation, but in some cases it is carried up some distance outside, entering at a considerable hight with a sheet iron casing. This is more expensive, but it allows of a solid stack foundation.

The draft stack itself we will consider to be 10 feet diameter and 180 feet high for this plant, the lining at the foundation being 18-inch fire brick, with a 3-inch expansion space between it and the stone wall, filled with light dry loam. Care in laying the brick is not so necessary here as in the furnace stack, and the clay can be used to lay pretty much as mortar is used, the laying consequently going on much faster and costing less per thousand brick laid, as nearly always this work is done by contract. The lower courses are of the lining and the sheet iron the bricks expand by the heat, and partly take up this space. If from any cause the stack is out of use for a sufficient time to allow the lining to cool, the bricks do not contract to the original diameter in which they were laid, and are held where they are by the weight above them. When heated again by the gases they expand once more, and so on, gradually approaching the circle of the sheet iron as their limit, until they finally touch it in a more or less perfect circle. If perfect, all will be fairly well; but they might as well have been laid that way at the beginning. But if the circle is imperfect—and I have seen cases where it is—the bricks will sooner or later begin to fall down the interior of the stack, partially closing the flue and leaving the sheet iron exposed on the inside to the action of the gases, almost immediately shown by the discoloration of the paint on the outside. This, of course, would soon ruin the stack; and at one furnace where this occurred, I had to get up two separate chimney stacks for the boilers alone, in order to keep the furnace in blast while the stack could be relined. I construct the chimney with the lining in each offset



Elevation of Boiler.

straightness in all flues and tubes, so far as possible, of course, without inconvenience in other regards, saving material and labor in first cost, and beyond question in the repairs that are liable to be necessary at any time. Overhead gas flues are now more generally the rule than formerly; they are of less cost where excavation for underground flues would have to be in rock, and they are very much easier cleaned from dust deposit, require no drainage, take less fire brick in lining and causes less trouble from explosions.

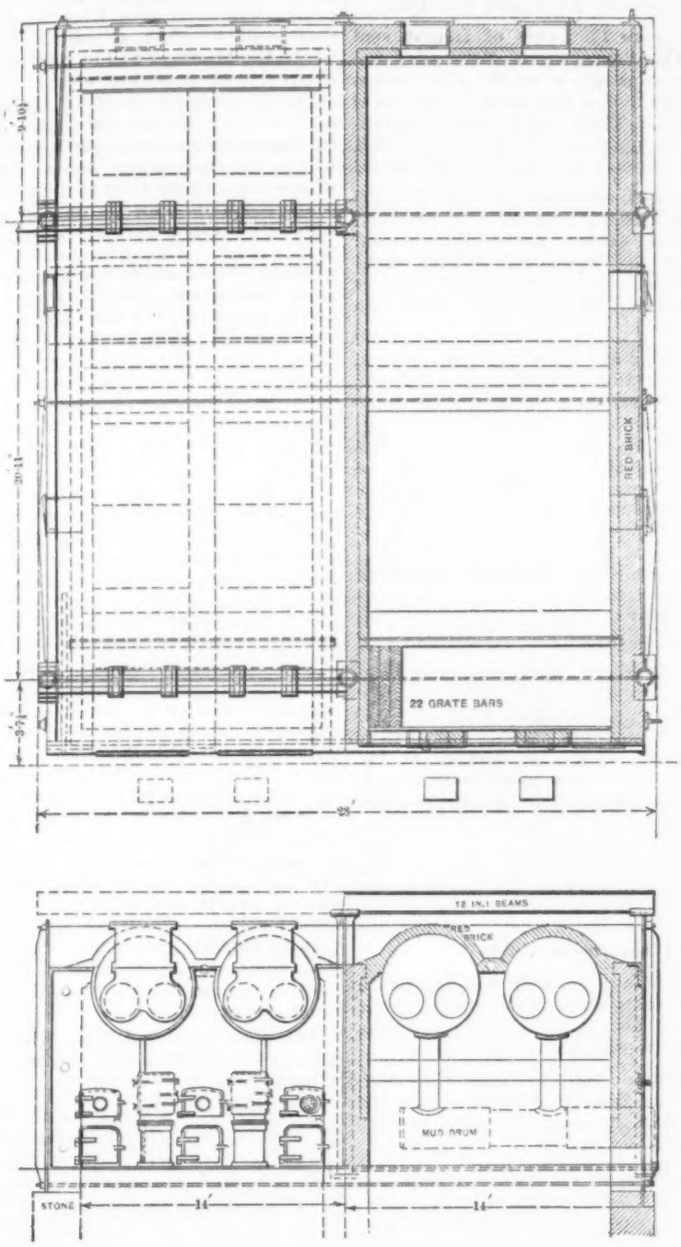
The draft flues from the stoves and partly also from the boilers to the chimney are, however, of necessity put either under ground or at least below the level of the stoves, except where stoves are used that have independent stacks of their own on top, as in several styles now in use. The Whitwell, however, is the one that has been mostly in use, and will be described here first, there being much to be said in its favor even yet. The flues to the draft stack for Whitewell stoves are under ground, lined with fire brick 9 inches thick, with arched top, and for such a plant as herein described will need about 40,000 fire brick. These flues run along the rear of the stove foundations, have downtakes to them from the chimney valves, 48 inches diameter, in case of 20 foot stoves, and slope sufficiently for drainage, from the stove

key brick, care being taken to break bond in each course. The first 20 feet of the sheet iron shell of the stack is made of curving and tapering plates, ⅜-inch thick, tap joint and single riveted in the vertical seams, about 3½ inches between centers. The lower ends of these curving plates are double riveted to a heavy cast iron plate, resting on and bolted with eight bolts, 2½ inches or 3 inches diameter, that secure it to the stone foundation. This plate is made up of segments, with flat bases, 12 inches or more wide, 2½ inches thick, and with a sloping flange on the upper surface to take the plates above described, this flange being about 1½ inches thick and bracketed on the inside to the flat plate. There are "bosses" or projections for the bolts sufficiently located to allow the turning of the nuts of the bolts. The space left between the fire brick lining and the curving sheets of the base is filled up with red brick, built out close against the stack, but with a 2 or 3-inch expansion space, and this red brick filling extends up about 20 feet.

At this hight in the chimney stack the courses of fire brick lining diminish to 9 inches, and from what I have observed I believe it is better to commence this 9-inch lining against the sheet iron rather than to leave a space between it and the brick, as has very often been done in stacks that I know of. If nothing is put between

of reduced thickness of brick, set out against the sheet iron. This, by the way, is the easiest method for the bricklayer. The stack tapers regularly from the curved base to the top, and the brick lining is therefore reduced in thickness, so as to keep the same diameter of opening at each point where a change of thickness of lining is made. In some large stacks the lining at the top is reduced to 3 inches, but I think 4½ inches the least that should be used in a stack of 10 feet diameter, for the wall of this thin lining is very high, and the thinner the bricks the less likely are they to keep their positions. Beginning with the bottom courses of an 18-inch wall made of two courses of 9-inch No 1 keys, there will be about 44,000 of these in such a stack, then 9000 —13½-inch keys with 600—13½-inch squares to make the approximate circle, then above them, specially moulded bricks are required, circle brick 68-inch outside radius, 7 inches wide, and 9 inches on outside circumference, 2½ inches thick, of course, as all bricks used are, unless especially mentioned. There will be about 11,000 of these required. Above them come the final 4½ inch courses, circle brick 66-inch outside radius, 4½ inches wide and 8¾ inches on outside circumference; 7500 of these complete the lining. It will generally be found that some bricks will be left in excess of what is necessary, but in a

draft stack it is difficult to be very close in the estimate, and this size of stack takes, as above, over 72,000 bricks. The bricks are laid in the stack, and also in the furnace shell and downcomer by means of easily built scaffolding, a cross bar with pulleys leading a rope from the interior over the top and down the outside of the stack, furnishing easy hoisting gear for material, operated generally by a portable winding engine powerful enough to raise all the other work.



Section and Plan of Boiler..

Perhaps there is no detail about a furnace that is more important than the boilers and setting, and there is a vast amount of difference of opinion concerning them. Plain cylinder type boilers have been longest in use, and continue to be used in many new designs for plants. They will, however, not be described at present, as they take more room, cost more, and give less steam for their space and cost, as a rule, than do the two flue types of boiler that will be described and which are largely in use. These are from 48 inches to 54 inches diameter, with two flues side by side, from 15 inches to 18 inches inside diameter, and from 30 feet to 36 feet long. There is little use in making a flue boiler over 30 feet long that has to be fired with the furnace gas of average quality. It will not keep in flame for even 30 feet usually, and every inch over that length is so much the more difficult to keep clean and free from the deposit from the gas, sometimes a serious matter causing low steam, or the use of much coal in firing the boilers. The class of labor generally found available at a low cost about a furnace has the limit of its intelligence reached in the keeping of water in these boilers sufficient to keep the flues from being burnt, on the one hand, and in preventing priming on the other, and any more sensitive class of boiler than this is apt to bring disaster to the plant, unless better men are provided to look after the water than those usually employed. A 54-inch flue boiler can be very easily freed from any deposit of mud or scale all over, which is a consideration, and it will give little trouble in making steam, if the steam drum is large enough and the steam pipes are all made to drain easily back to it, always provided that the setting is properly designed and well built. This means, again, a carefully made drawing and proper attention to practical considerations as well as theory. These boilers are set, four in a battery of two nests of two boilers each, with a fire brick faced dividing wall between from 22 to 24 inches thick. The drawing shows the construction of the setting just as built, and some 14 of these boilers provide the necessary steam for the 17 x 75 feet furnace described. The boilers do not rest in any way upon the brickwork of the side walls in any good setting, but are hung by 1¼ inch bolts from two I beams carrying cast iron washers. Some are provided with strong car springs at this point to allow for movement in expansion, &c. In short boilers this is not often done, the expansion taking place with the vibration of the hangers. The fronts of the boilers project sufficiently beyond the cast iron front for the rivet heads to be on the outside of it, and beyond, merely touching here, it is decidedly not a good plan to allow the weight of the boiler to be taken on the front at all. If the I beams (channels are sometimes used here) are set pretty close to the front they can carry all the weight well enough, leaving the front perfectly free from the disturbing effect of expansion movement in the boiler itself. Then the fire brick lining of the front will remain serviceable. The weight carried on the I beams should not be transmitted to the side walls, but be carried independently on the cast iron columns, as shown, which in this case are flanged so as to act as buckstaves and keep the side walls in place. There is needed in each of these walls a wide, strongly ribbed plate set at about the point where the heat is most intense, to assist the buckstaves in preserving the walls, which are apt to crack and fall apart if not so secured, especially if they are made thin, and even considerable thickness does not always preserve them. They should never be expected to carry a furnace boiler, and their tops should be secured with plates also.

While it is the intention to use the furnace gas for fuel entirely under these boilers, provision must be made for firing them with solid fuel, and to that end grate bars and bearers are provided, with regular fire doors, ash pit doors, &c., as usual, in other boiler fronts. The general rule is to place these grate bars so as to be fired from the front, that being the more convenient method where four boilers are set in two nests, for otherwise the batteries must be spread over more ground if they are to be fired from the side. A plain bridge wall is easiest to build and keep in repair, and answers all the purposes reasonably well; therefore the checker work style with complicated side bridge, walls, &c., will not be described, although used (at the start) in many plants, but, I believe, seldom rebuilt in making general repairs. Nor will any patented device for gas burning be shown or described, a cheap and extremely simple gas burner being in very successful use at new furnaces doing good work. The considerations here are the easy control of gas, proper admixture of air and removal of dust, as well as cheapness of first cost and repairs. The details will show the gas burner, which consists of a short cast iron nozzle, a cast base flange for the sheet iron downtake, a damper and frame and explosion or cleaning door, and I am unaware that these are patented, as, however, many other most necessary details about the furnace and stoves are. Beyond the bridge wall is a space left for gas deposit or dust, and a cleaning door and frame is provided to remove this occasionally. For convenience in doing this 5 feet of space is enough to leave between the settings, which are 28 feet outside walls in width.

The African Republic of Liberia now exports little besides coffee. India rubber obtained there is monopolized by an English company.

THE WEEK.

The Brotherhood of Locomotive Engineers closed their annual convention in Pittsburgh after a session of 27 days. One of the most important questions was that of federation with other organizations, which was decided in the negative. The total membership of the order is 27,715, being an increase of 2337 during the year. This is a marked gain over average years, the annual rates of increase being 1500, and shows the steady growth in popularity and power of the organization.

No war ship can be exhibited at Chicago, as no vessel drawing more that 8 feet 9 inches of water can pass through the Canadian canals.

The census of the United States is so far completed that the total population has been announced as 62,480,540. There is very good reason for believing that this total is about 2,000,000 too small.

The title of the Grant Locomotive Works to lands near Chicago, valued at $700,000, has been confirmed by the Supreme Court of Illinois.

Numerous specimens of Holland brick are carried away as souvenirs from Fraunces' Tavern, otherwise known as Washington's headquarters, at Broad and Pearl streets, in this city, now in course of demolition

The New York Street Cleaning Department will have a new "plant" of horses and carts, for which $200,000 has been allowed.

The consumption of petroleum in France, although not having yet attained the development which exists in Germany and Belgium, is progressing rapidly. The consumption last year amounted to 184,400 tons, and as France is not producing petroleum, she takes her supplies principally from America. Of the importations in 1889 only 20,000 tons were refined oil. Owing to a proposed change of duty the nature of the exports from the United States, it is expected, will be entirely changed, the crude product giving way to refined oil.

The same English contractors who are building steamers for the Canadian Pacific service offer to provide in a like manner for the Atlantic service. Parliament has sanctioned a subvention of $500,000 annually for a 20-knot speed, but there seems to be a difficulty in steaming so fast without more money. Hence there is delay in concluding a contract.

The beet sugar refinery just started at Grand Rapids, Mich., is the second of its kind in the United States, and has a capacity of 250 barrels a day. The company's investment is $750,000.

The Havana Chamber of Commerce, in a statement to the Spanish minister of the colonies, expresses deep concern respecting the financial condition of the West India provinces unless the tariff is so modified as to encourage trade with the United States. One cause of disturbance is that Brazil is preparing to compete with Cuba in supplying the United States with sugar, and fears are expressed that Brazil will be as successful in this endeavor as she was in wresting from Cuba the palm for producing coffee.

Cubans urge the Government at Madrid to grant them free coal.

The new criminal courts building, to be erected in Center street, near the Tombs, when completed will be the finest court house in America. It will almost cover the entire square bounded by Centre, Franklin, Elm and White streets. It will extend 190 feet on Franklin street and 188 feet on Center and Elm streets. It will contain six stories, and its greatest hight will be 115 feet. The principal story will be built of gray granite, with polished granite work about the main entrance. The upper stories will be of buff brick ornamented with red sandstone. The entire building will be constructed of absolutely fireproof materials, at an estimated cost of $1,400,000.

A report received in Montreal that Secretary Windom favors a restriction of bonding privileges caused a heavy fall in Canadian securities here and in London.

There were 1700 cars of freight sent across the Pennsylvania Railroad Company's new bridge over the Ohio below Pittsburgh in the first week after it was completed. There was no time for dedication or opening ceremonies on that bridge. Its cost thus far is $1,250,000.

An immense warehouse to cost $1,000,000 and to be fireproof has been commenced on Seventh avenue above Fifty-second street for the Manhattan Storage Company. It will have a frontage of 200 feet and be divided by thick brick walls into two parts.

The special agent of the Census Bureau for the collection of statistics of vineyards reports 400,000 acres under the vine culture, with 300,000 acres in full bearing The value of vineyards and wine cellars he estimates at $155,000,000. California has 150,000 acres. In New York there is a vast area of vineyards about Lake Keuka and Canandagua Lake; much wine is produced, but most of the grapes are sold for food. California puts seven-eightbs of her grapes into wine. Nearly 40,000,000 gallons of wine will be made this year in the United States.

A steam heated wharf shed has been added to the shipping facilities of New York, for the handling of fruit cargoes, at the foot of Canal street. Large doors swinging up from the flooring of the wharf give ingress and egress to the trucks. Steam pipes run from the large boiler room on the wharf to the inclosed portion, and are so arranged that at five minutes' notice all heat needed will be furnished to any particular part or the whole of the shed, and whenever the weather is cold enough to require it, day or night, the steam will be turned on.

The labor supply in North and South Carolina, Georgia and the Mississippi River bottoms is not sufficient to gather the enormous crops of cotton.

The Teutonic holds the record for both Eastern and Western voyages. Her last trip out was made in five days and 19 hours.

The new French Tariff bill was issued on the 25th ult. The duty on steel is lowered and raw cotton is exempt from duty.

Carrying a large steel ocean steamer in sections from Lake Michigan to the Atlantic is being attempted in Canada with every prospect of success. The vessel referred to is the Mackinaw, built by the Saginaw Steel Shipbuilding Company, at West Bay City, Mich. She was cut in two at Buffalo and towed from thence to Montreal and Quebec, where she will be put together and started for New York, to engage in the Atlantic trade. The vessel registers 2579 tons. The builders have several others contracted for and say the work can be done as cheaply as on the Clyde. The vessel accomplished the distance from Buffalo to Montreal, passing through 43 canal locks, in about 11 days, without any difficulty.

The East River tunnel scheme again comes into notice. Its promoters affirm their intention of proceeding with the work as soon as they can obtain a franchise from the Board of Aldermen. The proposed tunnel will extend from the Hudson River on the west side of this city, under Forty-second street, in a direct line across the East River to Long Island City. The idea of this is to establish a complete rail connection between the New York Central and Hudson River Railroad and the Long Island Railroad. Chief Engineer O. W. Barney claims that there will be no engineering difficulty in constructing the tunnel under the river. The entire tunnel will pass through rock which is, according to the examinations which have been made, solid and free from fissures. A shaft will be sunk at each shore from which the headings will be driven. These shafts will be 3300 feet apart. The line across the river passes under Man-of-War rock, which is bare at low water. A cofer dam, having an area of 3000 square feet, will be constructed here, and a third shaft will be sunk to the level of the tunnel and connected with it for the raising of such materials as can conveniently be brought to that point. This plan provides for the working of two additional headings, and also constitutes the first step for the removal of this rock by the Government in operations like those prosecuted at Flood Rock. Should disintegrated rock be encountered, the tunnel could be excavated by means of caissons or other appliances. The tunnel is to be five miles long, and will cost $1,000,000 a mile, exclusive of stations.

The Prussian Minister of Commerce has before him a plan which has been approved by the Emperor for starting a workingman's colony at Lichtenberg, a suburb of Berlin. It is proposed to erect there 4000 model houses and place them at the disposal of poor people at a monthly rent of $5. The houses are valued at 4000 marks, and the cheap rent stands in lieu of payments by installment on the property, so that the tenant or his family enters into ownership of the home after 20 years' occupancy without the least extra payment. The houses have a 7-meter frontage and a depth of 9 meters, with gardens in front, big yards at the back, together with cellers and wash houses. The entrance floor contains a parlor, dining room and kitchen, the second floor three large sleeping apartments, and over that an extensive garret. The latest information is that the Government contents itself simply with approval, the condition of the treasury not warranting the use of funds for building purposes.

The New York and Porto Rico Steamship Company have been incorporated at Albany.

A Sheffield, England, paper takes a very desponding view of trade prospects in that city. The editor says the Germans, shut out from the great market of the United States, must sell out their surplus or go into liquidation, and that they will flood Sheffield with their wares, unless every articie imported is distinctly marked, to show its origin. France, too, we are told, is likely to vie with the Germans in trying to recoup themselves for the McKinley tariff at England's expense.

The Government of the Netherlands has been trying to place itself on a gold basis. At the beginning of the year it had £5,000,000 worth of silver and about an equal amount of gold. The disparity between the two metals was so great in commercial value that it decided to dispose of its silver. The new silver law of the United States offered an opportunity. An emissary was sent to the United States, and he made a deal to sell his country's silver at $1 an ounce—7 cents higher than it ruled when he started. A banking house in Wall street undertook the sale. It organized a pool for the purchase, and the silver was bought, but it still remains in Holland.

MANUFACTURING.

Iron and Steel.

The Newberry Furnace, at Newberry, Mich., was blown in on October 20, after being out of blast 30 days for repairs. The Detroit Furnace, under the same management, is now being repaired, and will start up with a new stack and a new Weimer blowing engine.

The North Branch Steel Works, at Danville, Pa., which has been idle for some time on account of a strike among the workmen, has again resumed operations. This plant gives employment to a large force when in full operation. The mill was formerly known as the Co-operative Iron and Steel Works, was established in 1871, and was operated for years as a rail mill. It was changed to a steel mill in 1882-3 and an open hearth steel plant added. The first steel was made February 15, 1883, and it has now an annual capacity of 132,000 net tons.

The Slatington Rolling Mill Company, of Slatington, Pa., have completed their rolling mill and begun the production of muck bar. They will be ready to make merchant iron about November 1. William P. Hopkins, formerly connected with the Catasauqua Mfg. Company, of Catasauqua, Pa., is general manager; Dr. A. P. Steckel, president; Joel Neff, treasurer; S. De Long, secretary.

Furnace No. 1 of the Carrie Furnace Company, at Rankin Station, Pa., which has been idle since July undergoing repairs, will probably resume blast during the present week.

On account of a business disagreement between the stockholders, the Board of Directors of the Mary Pratt Furnace Company, of Birmingham, Ala., have asked that a receiver be appointed, the property sold at public auction and the affairs of the company wound up. Valuable contracts for ore, coke and limestone, which have several years yet to run, will go with the property. A bonded debt of $100,000, bearing 7 per cent. interest, was placed upon the property in 1889 and has nine years yet to run. Fifty-seven thousand dollars of these bonds yet remain unpaid, and it is expected that the property will be sold subject to these outstanding bonds.

The Youngstown Iron and Steel Company, of Youngstown, Ohio, are erecting seven additional puddling furnaces at the plant of the Warren Iron and Steel Company, at Warren, Ohio, which they recently purchased. The machine shop, roll turner shop and blacksmith shop of the Youngstown Rolling Mill Company, which they also control, were destroyed by fire on the night of the 25th ult. The loss was large, but not so heavy as has been reported. The company have already made plans for new buildings of suitable size, which will be of iron. The fire has not interfered so far with the operation of their plants, although they are working at some disadvantage. The Youngstown Iron and Steel Company now own and operate three separate plants, as follows: The Trumbull Iron Company, at Girard, Ohio, the Youngstown Rolling Mill Company, at Youngstown, Ohio, and the Warren Iron and Steel Company, at Warren, Ohio. The officers of the concern are as follows: Henry Wick, president; T. H. Wells, first vice-president; J. C. Wick, second vice-president; W. H. Baldwin, secretary, and George D. Wick, treasurer and general manager.

Robinson Furnace, at Robinson, Pa., has blown in after making repairs.

Repairs at the Chartiers mill of the Lockhart Iron and Steel Company, Pittsburgh, Pa., have been completed, and the works are again in operation. Of the 12 new puddling furnaces being added, five are completed and in operation.

No. 1 furnace, of the Isabella Furnace Company, Pittsburgh, has been blown out to put in a new lining. The furnace had made 176,252 tons since August 1, 1888, when the present lining was put in. No. 3 stack is completed and ready to go in blast.

No. 5 furnace, of the Thomas Iron Company, at Hokendauqua, Pa., has gone out of blast for repairs.

The Floodwood (Ohio) furnaces, of the Ohio and Western Coal and Iron Company, James A. Hall, receiver, Columbus, Ohio, have been leased to the Columbus and Hocking Coal and Iron Company, of Columbus.

Rumor has it that the Rensselaer rolling mill, at Troy, N. Y., which has been idle for the past two years, is to be converted into a plant for the manufacture of tin plates by the Standard Oil Company, of New York. This company own a controlling share of the capital stock of the Troy Steel and Iron Company, and are among the largest consumers of tin plates in this country.

J. D. Smith & Co., of Cincinnati, Ohio, have just issued their price-list and catalogue No. 9. This company, as is well known, provide the entire outfit for a foundry (with the exception of metals and fuel), and their catalogue therefore embraces everything necessary in foundry practice.

The Scranton Steel Company, Scranton, Pa., in one turn of 12 hours, October 30, with their one blooming train, bloomed 491 ingots, 56 of which were bloomed in the last hour, between 5 and 6 o'clock. This work has not yet been equaled by any blooming train in Scranton city.

Some time ago we made mention of the fact that the Pittsburgh Iron and Steel Engineering Company of Pittsburgh, had closed a contract with the West Superior Iron and Steel Company for the erection of a Bessemer plant and a plate mill. Having in view the rapid and growing demand for structural steel in the Northwest, they have decided to put themselves in position to make structural shapes up to 14 inches, and have placed an order with the Pittsburgh Iron and Steel Engineering Company for a 20-inch structural mill with 36 x 48 engines, shears, and a full complement of machinery. Owing to the severe climate of that district, the buildings will all be of iron, and will cover about two acres of ground. The iron and steel required for the McDoughal ship yards, at West Superior, will be furnished by this company, and it is expected that at least 40,000 tons will be required next year.

The recently organized Ashland Steel Company, of Ashland, Ky., have placed the contract for the erection of their plant with the Pittsburgh Iron and Steel Engineering Company, of Pittsburgh. It will be similar in construction to the Bessemer plants of the Wheeler Steel Works, at Wheeling, W. Va., and the Loughlin and Junction Steel Company, at Mingo Junction, Ohio. It will contain two 5-gross ton converters and a 32-inch blooming mill. They expect to use Lake Superior ores and Pocahontas coke, which is probably the first attempt made in this country to use the above ores and coke in the manufacture of Bessemer steel. This has been made possible by the extension of the Norfolk and Western Railroad from the Pocahontas coke fields to Ashland, Ky. The Ashland Steel Company have been formed and are composed of parties interested in the Norton Iron Works, of Ashland, Ky., the Bellefonte Iron Works Company, and the Kelly Nail and Iron Company, of Ironton, Ohio.

During the month of October there was produced at the Edgar Thomson Steel Works, of Carnegie Brothers & Co., Limited, at Braddock, Pa., 32,290 tons of finished rails.

Secaucus Furnace, at Secaucus, N. J., now holds the record for an all anthracite furnace. The production of the furnace, which is 65 x 17 feet, was an average of 587 tons per week during the past five weeks, with an average fuel consumption of a little less than 1 ton 3 cwt. per ton of iron. Last week the furnace made 612.5 tons. No hard iron was made during the five weeks in question.

Machinery.

The steam regulating devices manufactured by the Mason Regulator Company, of Boston, Mass., are illustrated and described in a pamphlet just issued. In it we find description of the latest forms of air brake pump regulators, reducing valves, pump pressure regulators, steam damper regulators, pump governors, balanced valves, &c.

The Chapman Valve Company are building an addition to their works at Indian Orchard, Mass. The building will be of brick, 120 x 50 feet, three stories high, and will increase the output of the company about 30 per cent.

The Buss Machine Works, of Grand Rapids, Mich., have been offered $20,000, cash, and a large tract of land to remove their works to Benton Harbor, Mich.

The machine shops of William Kesselman & Co., at Butler, Pa., were recently destroyed by fire at a loss of $10,000.

Tinius Olsen & Co., of Philadelphia, have just issued several new circulars describing their testing machinery for textile materials, duplex micrometers, measuring instruments, Novelty patent hand drill, stone finishing machine, marble molding and countersinking machine, and several forms of hydraulic presses and machinery.

The steam specialties and supplies made by the Sherwood Mfg. Company, of Buffalo, N. Y., are described and illustrated in a recent catalogue. These include injectors, ball gauge cock, tube scrapers, hand cylinder oil pump, compression grease cup, combination ratchet drill, steam and pressure gauges and other engine and boiler supplies.

T. M. Nagle, Erie, Pa., issues an illustrated catalogue "B" of his portable and stationary agricultural and vertical steam engines and boilers. These are described at length, with illustrations of the various styles. Claim is made that these engines are built from entirely new patterns, with improvements which will recommend them to those interested in this line of machinery.

Medium and high speed engines manufactured by the Ætna Machine Company, of Warren, Ohio, are fully described in a recent pamphlet issued by them. The description and illustrations cover the construction of the engines in detail.

The recent publication of the Salem Foundry and Machine Shop, of Salem, Mass., is devoted to describing and illustrating their latest forms of freight elevators. In it are shown their steel screw floor and hanging machines, balance elevators, automatic closing hatch and other valuable matter pertaining to this kind of machinery.

Curtis & Curtis, of Bridgeport, Conn., have just issued a catalogue completely describing their pipe cutting and threading machinery, several of the most important forms of which we have described in former issues of *The Iron Age*.

Cutter heads to fit any matcher, molder or tenoner for flooring, siding, doors, sash, blinds, &c., are fully illustrated and described in a catalogue issued by the manufacturers, Samuel J. Shimer & Sons, of Milton, Pa.

The Western Locomotive Company have been incorporated in the State of Washington, with a capital stock of $2,500,000, in $2500 shares. John L. Ayer, Joseph Hadurger and F. D. Burton are the incorporators, and the purpose is to locate the principal works at Seattle. The company will manufacture portable engines of all sorts.

The New York office of the Smith & Vail Pump Company have now well under way the following large pumping engines: Water works compound pumping engine of 2,000,000 gallons daily capacity, for Anderson, S. C.; water works compound pumping engine, 1,500,000 gallons daily capacity for Waterbury, Conn.; duplex hydraulic pumping engine, 18 x 3 x 15, capacity 30 gallons per minute at 2000 pounds water pressure, for the American Mining and Milling Company, of Port Jefferson, S. I., and one compound duplex pumping engine at Bloomingdale's store, Fifty-ninth street and Third avenue, New York, of 3,000,000 gallons daily capacity. The works are overcrowded, and are at the present time running day and night.

The Champion Machine Company (Amos Whitely & Co.), manufacturers of agricultural machinery, Springfield, Ohio, have asked an extension on their annual payment of $130,000 of bonded indebtedness, due November 1, 1890. At the time of the Whitely, Fassler & Kelly failure, 1887, the firm held $1,350,000 of accomodation paper of the then Champion Machine Company. In the East street settlement the Whitely, Fassler & Kelley Company assumed payment of one-half of this paper and the Champion Machine Company, of whom Amos Whitely was president, the other half. This debt of $675,000 was bonded and secured to the creditors by the mortgages on the real and personal property of the Champion Machine Company's plant, to be met in five equal annual payments of $130,000. No time is set at which the payment at present due can be made in the circuliar request for an extension.

Hardware.

The Skinner Chuck Company, New Britain Conn., have just completed a brick factory, three stories, containing all the latest improvements, which they expect to occupy. The demand for their chucks has been such that they were obliged to build a factory for their better accommodation, although the lease on their present quarters does not expire for some time.

The Kidd Steel Wire Company, Harmarville, Pa., manufacturers of polished drill rods and coiled wire, are now drawing for watch and watch tool companies polished drill rods to the thousandth of a centimeter on the metric gauge, something, it is stated, never before attempted by a manufacturer of drill rods. They are also making a specialty of drawing all kinds of shapes and sections to the thousandth of an inch, such as watch case springs of exact section to fit the case without any additional work whatever; squares, rectangles, octagons, hexagons, ovals, &c. The quality of their rods is referred to as having been pronounced equal or superior to Stubs'. They have recently begun the manufacture of needle wire with very satisfactory results.

The manufacturing business carried on under the name of Safety Alarm Company, 61 and 63 Mulberry street, Newark, N. J., has been changed, and will hereafter be known as the Hardware Specialty Company.

The Terre Haute Shovel and Tool Company have been organized at Terre Haute, Ind., with a capital stock of $100,000. The object of the company is to manufacture and

sell all varieties of agricultural and horticultural implements and tools.

The following new companies have recently been incorporated with the Secretary of State, to operate in and about New York City: Balkana Mfg. Company, of New York, to make and sell door checks and springs, pneumatic and otherwise, and other hardware specialties; capital, $20,000; trustees, George H. Sweet, George F. Ross and Augusta C. Maas. Shadbolt Mfg. Company, of Brooklyn, to make and sell wagons, trucks and other vehicles; capital, $125,000; and incorporators, W. Oscar Shadbolt, J. Nelson Harris, John C. McGuire, Edwin C. Low and William C. Sheddon.

Rice Tinware Company, Kansas City, Mo., are putting on the market a line of pieced tinware, but have not yet commenced the manufacture of japanned ware.

Miscellaneous.

The Pitts Mfg. Company, of Marseilles, Ill., have decided to remove their threshing machine works to Joliet, to secure better transportation facilities. Work has already commenced on the buildings to be occupied by the company at Joliet.

The Chicago Foundry Supply Company are building at Eighteenth and Rockwell streets, Chicago, a factory 383 x 110 feet, with a capacity of 500 barrels of facing a day. The works are connected by sidings with the C., B. & Q. and Pan Handle railroad systems. The officers of the company are Thos. G. Griffith, president and treasurer; Jos. S. Hibbs, vice-president; Curtis H. Remy, secretary. Jacob Masmer, formerly with J. D. Smith & Co., will be the superintendent.

The Studebaker Mfg. Company are making extensive additions to their wagon and carriage works at South Bend, Ind. When the new buildings now being erected are stocked with machinery their productive capacity will be fully a third greater than before. The past year has been a veritable harvest for the wagon builders, whose business has enormously increased.

Among recently authorized corporations in Illinois are the following: Streeter Globe Iron Works; location, Chicago; for the manufacture and sale of standard iron and steel work; incorporators, Herbert A. Streeter, Patrick A. Hines and Ralph W. King. The Adjustable Incandescent Light Joint Mfg. Company; location, Chicago; for the manufacture and sale of incandescent light joints; capital stock, $50,000; incorporators, John Long, Cornelius Gaffney and M. W. Clark. The Schuttler Mfg. Company, at Chicago, to manufacture machinery and tools; capital stock, $50,000; incorporators, William L. Johnson, C. W. Higgins and C. B. Wood. Cork Faced Collar Company, at Lincoln, to manufacture horse collars, &c.; capital stock, $50,000; incorporators, S. A. Foley, D. H. Harts and A. E Boyd. Maxey Steam Boiler Compound Company, at Chicago, to manufacture a compound to prevent incrustration of steam boilers; capital stock, $20,000; incorporators, James R. Maxey, John P. Harr and W. A. Butler. S. C. Samuel Mfg. Company, at Chicago, to manufacture all kinds of tools and machinery; capital stock, $100,000; incorporators, S. C. Samuel, Edward Stockwell and Charles A. Buell. The Fisher Movable Frog and Railway Appliance Company, at Chicago, to manufacture railway appliances; capital stock, $500,000; incorporators, J. H. Fisher, W. A. Wilmet and J. H. Callaham. Northwestern Bicycle Company; location, Chicago; to manufacture and sell bicycles and novelties; capital stock, $15,000; incorporators, William R. Walpole, John State and William E. King. The C. H. Dunham Mascotte Cycle Company; location, Chicago; to manufacture, sell and deal in bicycles and other machines and appurtenances; capital stock, $1,000,000; incorporators, Charles H. Dunham, Charles Foxwell and George R. Bidwell.

A company for the manufacture and sale of car wheels and other railway appliances has been organized at Detroit, Mich., under the title of the Rigby Safety Car Wheel Company. The capital stock is $500,000, of which $325,000 is paid in.

Among the new concerns recently incorporated at Seattle, Wash., are the Tide Water Iron Works Company, with a capital stock of $4,500,000, divided into 4500 shares of the value of $1000 each, and the Western Locomotive Company, for the manufacture of locomotives, having a capital stock of $2,500,000. Seattle will be the principal place of business of both concerns.

Ground has been broken at St. Louis, Mo., for a large establishment for the manufacture of sewer pipes, which will be the largest of its kind in this country. The main building will be 255 x 100 feet, four stories high, with an annex on one side and cross ends, 450 x 60 feet, for the boiler and engine house, kilns and storage department. The buildings will be entirely of brick, and will cost in the neighborhood of $55,000, exclusive of machinery.

The Beaver Tube Company, of Wheeling, W. Va., have been incorporated with a capital stock of $1,000,000.

A circular issued by John T. Towsley, Cincinnati, describes the many forms of steam glue heaters built by him. A second circular is devoted to improved factory and wareroom trucks of several kinds.

We have received from the Gilbert & Bennett Mfg. Company, of New York and Chicago, a sample of aluminum wire cloth. The circular accompanying this says that the sample presented is a portion of the first roll, and that while it is expected that it will not at once supersede cloth made of other metals, as its cost is three or four times that of brass, it is, however, thought that for many purposes it can be advantageously substituted. It is particularly adapted for use as screens in water works, where acids are used, for evaporators, strainers and druggists' sieves, &c. Owing to the limited present demand it is made by the above company only to order.

The Atlas Iron and Brass Works are about starting at Duluth; also the Holmes Tripod Boiler Company, who will manufacture the Hazleton boiler.

The steam hot blast drying and heating apparatus manufactured by B. F. Sturtevant, of Boston, Mass., is well known, and its value appreciated. A catalogue just issued by him presents the newest designs of this apparatus, adapted for heating buildings and drying lumber. The illustrations employed show the construction of the apparatus and then its practical operation.

Circular No. 4, of the Thomson Electric Welding Company, is a very interesting and valuable description of the electric welding process as perfected up to date. It shows the machines built by the above company and the application of the process to general metal working, shaping, tempering, forging, &c., and the special advantages claimed. As supplementary matter, it gives extracts from reports on the process of electric welding by Professors Chas. R. Cross, A. E. Dolbear, Silvanus P. Thompson and others. There are also printed letters from manufacturers who are now using electric welding machines, and who state that the process is far more economical and rapid than the old methods, and that it appears to be perfectly adapted to the work in hand. Some of these letters are from Wallace & Sons, Ansonia, Conn.; John A. Roebling's Sons Company; Weed Sewing Machine Company; Trenton Iron Company, and the Perry Mfg. Company, of Indianapolis, Ind.

The ice and refrigerating machines built by the Murray Iron Works Company, of Burlington, Iowa, are fully described, both in construction and operation, in a very handsomely illustrated catalogue. This may also be said to constitute a practical explanation of ice making and refrigeration.

The Hooker patent steam pumps have been manufactured in San Francisco for the last 20 years, and over 6000 are now in use on the Pacific Slope and in China, Japan and the Sandwich Islands. These pumps are now made in St. Louis from entirely new patterns, which embrace all the latest improvements made by William D. Hooker, by the Hooker-Colville Steam Pump Company. These pumps are simple in construction, durable, economical in the use of steam and have comparatively very few parts. The recent catalogue issued by the above company conveys a good idea of the construction of this steam pumping machinery and of the various kinds of pumps built by them.

We have received the twenty-sixth annual catalogue of E. E. Souther & Brother, of St. Louis, manufacturers of corrugated sheets and dealers in all kinds of iron and steel. This shows all the various products made by them and for which they are agents.

The catalogue of the Northampton Emery Wheel Company, of Leeds, Mass., describes and illustrates in a very complete way all of the many machines built by them. These machines may be said to embrace all the forms which are now found necessary in the shop.

In reference to Magnolia metal, J. F. Wilson, chief engineer of the Equitable Life Assurance Society, New York, states that he has used it in the crank and cross head bearings of an Armington & Sims engine making 250 revolutions per minute, and also in the crank bearing of his main electric engine—a Watts-Campbell Corliss, and that he has never had trouble of any kind either from heating or otherwise. He says: "I further desire to say that in my 28 years' experience with machinery I have never found its equal for anti-friction and wearing qualities."

The new catalogue of the Berlin Iron Bridge Company, of East Berlin, Conn., contains many illustrations showing the most important works they have built lately in the shape of machine shops, foundries, railroad stations and the like. Among the works thus shown, and the principal features of which are briefly described in the text accompanying the engravings, are the following: Roof of the casting shop of the New Haven Copper Company, at Seymour, Conn.; iron roof for the Ansonia Brass and Copper Company; iron building for the Stanley Rule and Level Company; iron car sheds for the New York, New Haven and Hartford Railroad; machine shop for the C. W. Hunt Company, at West New Brighton, N. Y.; iron roof of the Aluminum Brass and Bronze Company; iron roof over the rolling mill for the Coe Brass Mfg. Company; rolling mill roof for the Seymour Mfg. Company, and many others of similar description. The work of this company in bridge building and iron roof structures is well known throughout the United States.

PERSONALS.

Fred. A. Dexter has been appointed secretary and treasurer of the Leavitt Machine Company, of Orange, Mass., to fill the vacancy made by the resignation of Geo. E. Bates.

Fred. M. Strong, secretary of the Laughlin Nail Company, of Wheeling, W. Va., has resigned to accept a similar post with the Wheeling Lamp and Stamping Company, of Wheeling, W. Va. J. R. Thomas, traffic agent of the Baltimore and Ohio Railroad at Wheeling, will succeed him.

George Berkley, the eminent engineer, vice-president of the Civil Engineers; Sir James Kitson, Sir Lowthian Bell and Hugh Bell are among those who sailed for Europe Saturday.

W. N. Page, of Richmond, Va., has just returned from a visit abroad.

Charles S. Clark has been appointed sales agent for New England of the Pennsylvania Steel Company, with headquarters at the Mason Building, Boston, Mass.

Another decision relating to the long and short haul clause was made by the Interstate Commerce Commission in Washington, 30th ult., in the case of W. S. King & Co., a Boston firm, against the New York, New Haven and Hartford Railroad Company, and the New York and New England Railroad Company. The question was whether these rail lines can make a joint through rate on shipments of flour from New York to Boston lower at Boston, to meet the competition of the Metropolitan Steamship Line, than the combined local rates of the two rail carriers from New York to Readville, for the shorter haul, where no such competition exists. It was decided that the carriers could do this without violating the long and short haul clause of the act to regulate commerce.

It is stated that the American Window Glass Company, the combination of window glass manufacturers recently formed in Chicago, will have their headquarters in Pittsburgh.

As a result of legislation affecting lead ore a big smelter is in course of erection at San Luis Potosi by the Mexican Metallurgical Company, a Kansas City organization.

To attract American manufacturers the Kingston, Canada, Board of Trade unanimously calls upon the local government to exempt from taxation any buildings or machinery employed in this brach of industry.

The feasibility of establishing a steamship line from Duluth to Fairport, Ohio, to connnect at the latter point with the Baltimore and Ohio Railroad system, is said to be under consideration.

The Iron Age

New York, Thursday, November 6, 1890.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, JR. - EDITOR.
GEO. W. COPE. - - ASSOCIATE EDITOR, CHICAGO
RICHARD R. WILLIAMS - - HARDWARE EDITOR.
JOHN S. KING. - - - - BUSINESS MANAGER.

The Steel Rail Market.

The purchase by the Carnegie interest of the mill of the Allegheny Bessemer Steel Company, consummated during the past week, may have an important bearing on the market for steel rails. Other negotiations now pending may contribute to the same result. Whether the final outcome will be a closer approach of those who now constitute the association remains to be seen. For the present and for some time past the combination of the steel rail manufacturers has accomplished little more than the maintenance of a statistical bureau and the yearly gathering of its representatives at a pleasant luncheon at Long Branch in the hight of the season. So far as the reports of shipments every month have been concerned, their accuracy has never been questioned. The reports of sales have been accepted with more reserve, opinions differing among those who reported as to what really constituted a sale. Occasionally the meetings have gone through the formality of making allotments, but we question whether any of the mills has believed itself hampered in sales by its allotment. It may well be questioned whether the slight advantages restricted to the use of monthly statistical reports have compensated for the odium which attached to a combination, the consistency of which has been aptly described as equal to a rope of sand. At every meeting the rail manufacturers have confined themselves largely to discussing the iniquity of allowing *The Iron Age* to publish monthly the totals of the reports of sales and shipments. But the whole plan, loosely as it was carried out, had little to commend it so long as so important a concern as the Allegheny Bessemer Steel Company stood aloof. The works were new, and besides possessing the advantage of being built according to the latest ideas, it was a disturbing factor in the market, which every new concern must be. Its rivalry came at a time when business was falling off, when there were not orders enough to keep all the mills busy, although one of the principal plants was undergoing reconstruction. It was a thorn in the side of rival makers, and particularly of those in the same district.

For many months steel rails have declined steadily in price, until they have sold lately at less than $29 at Eastern mill. Practically, there are three groups of mills in the business, the Eastern, including, in the order of their importance, the Scranton, the Lackawanna, the Pennsylvania and the Bethlehem, the Central, which embraced the Edgar Thomson, the Allegheny and the Cambria, and the Western, represented by the Illinois Steel Company. The Colorado, in the Rocky Mountains, is too unimportant to be considered a factor. The mills of the Chicago district have been constantly menaced by the Pittsburgh district, and occasionally the Eastern mills have invaded their territory.

The Pittsburgh mills have fought one another actively for a long time, meeting the Chicago mills in the West and the Eastern works in common Southern territory. The Eastern producers have waged a very sharp contest over the business of a relatively small market. The result has been that the railroads have held back longer this year with their winter and spring business than they have done for many years. Usually a large aggregate of orders is placed in August, September and October. Practically nothing has been done to date, and general anxiety and weakness has characterized the market. Now one of the competitors is out of the way, Illinois and Carnegie have become dictators in the West, and it is only in the East that the business is being competed for by four works. Unless the giants of the West struggle for supremacy, the markets in that section should escape unreasonable competition. In the East the situation is less clearly defined. The Pennsylvania Steel Company is on its march to the sea. Bethlehem is deeply engaged in its armor and gun work, leaving as the liveliest competitors Lackawanna and Scranton, the latter possessing the most modern plant. It is evident, therefore, that the sale of the Allegheny mill opens the possibility of a much closer and much more effective approach of the steel rail mills to one another. It is a contingency with which railroads will find it expedient to reckon. A successful issue of pending negotiations may make it a certainty.

Natural Gas in Pittsburgh.

The action of the Philadelphia Natural Gas Company, of Pittsburgh, in cutting off the supply of gas to the puddling furnaces in a number of the mills in that city has excited considerable comment. Predictions are being made on all sides that the supply is failing rapidly and will soon be exhausted, and that this is the beginning of the end of the fuel whose discovery and use has been the wonder and admiration of the scientific world. We do not think that the facts in the case will bear out these predictions. It is a well-known fact that the supply of natural gas has decreased to some extent, but not so largely as is generally supposed. It is also admitted that at some time in the future the supply will be exhausted. In the face of these facts, it is only natural that those persons who have invested largely in the development of natural gas territory should desire to sell the product at the highest price that can be obtained for it. When the use of natural gas as fuel was being introduced, contracts for its supply to manufacturers and private consumers were made at very low figures, in some cases at less than one-half the price that was paid for coal. There was no restriction whatever as to its use, and meters for the measurement of gas were not required by the companies nor asked for by the consumer. The result of this policy has been a reckless waste of gas in every direction by the consumer. In order to overcome this waste, meters were introduced and are now in general use, except in manufacturing plants, where the practice of contracting for gas at so much per annum is in force. Notwithstanding the attempt of the companies to curtail the quantity of gas consumed as much as possible, and still give the consumer all the gas needed, it has been found impossible to prevent shortages, and for this reason the supply has been cut off from a large number of puddling furnaces, where the waste is said to be very heavy, and from which the smallest income is derived. The price to private consumers has been increased 50 per cent., and the various companies intimate that in the future the interests of the private consumer will be taken care of, while the mills will get only what surplus gas may remain. While the manufacturers have been put to great inconvenience and considerable expense to alter their furnaces for the use of coal, it is possible that some arrangement will be made by which they will again be supplied with gas. For the present, at least, they will have to operate their furnaces with coal.

Steel Making in the South.

The progressive men in the South are deeply aroused over the question whether it is possible and will be profitable to make steel in the Southern States. Naturally the matter has great interest for other producing sections. In spite of all that has been claimed, there is little doubt that until now the only ore available for the acid Bessemer process thus far developed is that of the Cranberry range. While the expectations of those who had looked for rich ore have not been realized, the yield being between 45 and 48 per cent., the deposits are large. Excellent coke will be available either from Big Stone Gap or from the Flat Top district, so that the materials can be cheaply assembled at such points as Johnson City or Bristol. With the exception of an industry based upon these low phosphorus materials, the future steel makers of the South must rely, so far as it is possible to judge from present developments, upon ores which can only be treated by the basic process.

Thus far the only earnest effort has been that of the Southern Iron Company, at Chattanooga, concerning whose operations we gave some data in a recent issue of *The Iron Age*. The discussion of the question must, however, be preceded by some elucidation of metallurgical points involved. The basic process may be carried on either in the Bessemer converter or in the open hearth. The former calls for high phosphorus, low silicon and low sulphur pig. As yet none of the Southern plants produce an iron suitable

for basic Bessemer, the phosphorus being generally too low. Since the subject is not given consideration in the South at present, we may dismiss it.

The process upon which all hopes are centered is the basic open hearth. The specifications for pig iron for it call for low silicon and low sulphur, with phosphorus as low as it can be obtained, but on the whole of little importance. The vital point is that silicon and sulphur be low. So far as the ores are concerned, it may be stated in a general way that their sulphur contents are not likely to prove troublesome. It is different with the fuel. That does contain a troublesome percentage. There are two methods of lowering it in blast furnace smelting. The one is to carry heavy lime charges, but since that involves the production of a high silicon pig, it cannot be carried far. The expedient has been adopted of using highly calcareous ores. Another method for keeping sulphur down is to use manganiferous stock, charge a certain percentage of manganese ore, or make ore containing a moderate amount of manganese a part of the mixture. These ores are available in abundance in the South, although until now they have been shunned by the Southern furnaces, as detrimental in the manufacture of foundry irons. The measures of precaution to be adopted in the South are therefore to clean the coal of sulphur by washing as much as possible, and to use manganiferous materials in the furnace. The same precautions should be observed to carry silicon to the lowest notch. A certain amount of ash with its silicon contents seems to be necessary to give coke a physical structure suitable for bearing the furnace burden. The Alabama and Tennessee cokes, unwashed, are too high in ash to make it readily possible to produce, regularly, a low silicon pig. Washing the coal seems, therefore, desirable for this reason too. Then those ores should be selected which are calcareous rather than siliceous.

We are convinced that this can be done; in fact, it has been successfully accomplished in the Chattanooga district by the Tennessee Coal, Iron and Railway Company. There can be little question that Birmingham makers can attain the same end. But the idea might as well be dismissed at once that basic pig can be produced in either of the districts named at figures as low as those accepted as good average work for foundry and forge grades, say $9.50 to $10.50 per ton. We are inclined to the belief that in this respect the Chattanooga district may possess some advantage. It is, of course, not possible to estimate now how large this increase in cost is going to be; but it will be a factor which our Southern friends will be forced to take into consideration very seriously.

Given a pig of the desired specification, there are no obstacles whatever, metallurgically, to the production of basic steel in the South. Brief as it has been, the experience of the Southern Iron Company has proven that. We question, however, whether the labor and fuel cost can be readily brought down to the figures at plants in the North working under the same conditions in other respects. We do not allude at all to the advantages which the possession of that ideal open hearth fuel, natural gas, gives to the Pittsburgh district. On the other hand, the pioneers in basic steel in the South will have some advantages in being able to cheapen their charges by picking up considerable cheap country scrap. In Virginia the situation seems to us somewhat different. The pure Pocahontas coke, and the ores low in sulphur, should make it possible to produce a basic pig at little more than the cost of forge grades, which, in the Southwestern part of the State, can be put on cars at about $10.50 to $11. But, on the other side, the plants would be closer to the competing works of the North.

A cursory examination of the question seems to point to the probability that the Southern works can and probably will be able to manufacture enough mild steel to take care of the requirements of their own territory. Those requirements, after all, are not large, relatively speaking. Our Southern friends may regard that statement as somewhat rash. Let us state at the outset that there is no probability that Southern basic steel can well become the raw material for rail making. No open hearth plant could, in this country, make rails in competition with the Bessemer converter. With Pittsburgh commanding the Ohio and Mississippi rivers and a good deal of the territory by all-rail, and with tidewater works with easy access along the whole Atlantic and Gulf coasts, any Southern rail mill would be under cross fire. The whole Southern territory does not now, in time of activity, take enough rails to keep a modern mill fully employed. Probably the best chance would be in a rod mill, a wire-drawing plant, and the subsidiary industries of nail and barb wire making, because the basic open hearth produces a material peculiarly suitable for that class of goods. The unit of plant would be determined by the capacity of a single modern rod mill, making say, 40,000 gross tons annually. That, with its wire-drawing, cutting and barbing machinery would make one pretty large establishment; two would lead to entrance into markets in which works now in existence would claim and might hold the supremacy. There would remain the miscellaneous trade in bars, plates, sheets, axles, &c., which would furnish additional outlet. One industry in which a Southern steel plant might find remunerative work, is the manufacture of cotton ties, of which the tonnage is important and is growing. It is in that field that favorable results might be obtained.

But many of our more sanguine Southern friends look further into the future and hope that they can invade Northern territory with steel, as they did with pig iron. They overrate their own strength and underrate the power of those whom they would put on the defensive. In many lines they will be forced to meet cheaply produced acid Bessemer steel. Unless Southern producers could meet $26, delivered north of the Ohio or Potomac, for billets, which can be done under severe competition all along the line, they should not hope for trade.

The Canadian Iron Market.

John McLauchlan, the Chicago agent of the Andrews Bros. Company, of Youngstown, Ohio, recently made an extensive business trip to Canada. The information which he gathered with reference to the Canadian pig iron trade may have considerable interest for some of our readers. Throughout the province of Ontario he found numerous brands of American pig iron in foundrymen's yards. Not only were Northern furnaces quite well represented, but Southern companies appeared to have secured a good footing across the border. A grade of Southern iron with quite a good foothold is known in Canada as Alabama Scotch. All pig iron imported into Canada, whether from Great Britain or the United States, pays a duty of $4.48 per gross ton. The foreign iron most in demand in Canada is, of course, Scotch pig iron. The American iron going into Canada competes with the best grades of Scotch, and is at present making rapid inroads on the trade in such brands. At equal prices the American Scotch brands appear to be getting the preference over their foreign competitors.

A curious fact was noted in connection with the iron received in Canada from Scotland. The pigs were all whole, except those which had accidentally been broken in transit. The run of the furnace appeared to have been shipped and was classed by the makers as strictly No. 1 foundry. It is possible that some Scotch furnacemen, through long practice and with very uniform ores and coke, can run along regularly on a product which will vary but slightly from cast to cast. The pig iron seen in Canada, however, was not of this character. The pigs when broken for the cupola showed up quite unevenly, Nos. 2 and 3 being mixed with No. 1. In this respect the American furnacemen appear to advantage when compared with Scotch furnacemen. Our iron is always carefully graded at the furnace, each pig being broken to determine its character, as in no other way can this determination of quality be satisfactorily made. When an American furnaceman contracts to deliver No. 1 foundry pig iron he sees that it is all No. 1. The more generally this information is disseminated among Canadian foundrymen the more inclined will they be to purchase their iron from American makers. An important market is opening up in this direction, and it only needs to be carefully looked after and judiciously handled.

A special commission was appointed by Mayor Grant, of which General Sherman is chairman, to consider the scheme for improving Riverside Park. A sea wall, terrace and driveway are included in the plan, the latter to be supported by an arcade.

Good-Bye to the Iron and Steel Institute.*

BY R. W. RAYMOND.

What! You're already going away?
Where is that ancient virtue, then,
We used to hear so much of, pray—
The "staying power" of Englishmen?

Your sires and ours were different stuff—
They didn't cleave the ocean foam
For one short month, then cry "Enough!"
And set their yearning sails for home.

Well, Science has made ocean trips
So trivial that you came with ease;
And now, alas! too many ships
Invite you to recross the seas.

Yet we take comfort, since we know,
Whatever else remain unknown,
We cannot lose you now; for though
You sail away, you'll not be gone.

When folks in such a hurry pack,
They make mistakes; and you will find
It is *our* hearts you carry back
And yours that have been left behind.

Yet both shall gain and neither lose,
Meum and *Tuum*, once apart,
In Friendship's furnace simply fuse
To make one "homogeneous" heart!

Such be our union—ductile, strong,
Well tempered, proof to shot or shell,
Elastic, beautiful, as long
As steel endures!

Dear friends, *farewell!*

The Industries of Pittsburgh, Kan.

The plat of the original town of Pittsburgh was made in May, 1876. At that time the existence of the coal fields about the town site was known, but no organized attempt had been made to mine it. It was several years before the importance of the deposits was understood and mining begun on a large scale. An area of about 10,000 acres was bought up by the railroad companies entering Kansas, and it was thought at that time that the best of the coal land had been acquired by them, but later developments go to show that the coal fields cover about 150,000 acres in all. This coal is known as the Cherokee, after the name of the county immediately south of the Pittsburgh fields. An analysis made in 1887 by Prof. E. H. T. Bailey, of the State University of Kansas, shows that this coal contains 1.94 per cent. of moisture, 33.77 per cent. volatile matter, 52.45 per cent. fixed carbon and 8.84 per cent. ash.

An analysis made at the same time of the Pittsburgh, Pa., coal showed that the latter contained 54.17 per cent. carbon and 7.19 per cent. ash, which is only 1.72 per cent. more carbon and 0.93 per cent. less ash in the Pennsylvania than in the Kansas coal. Some grades of the Cherokee coal will show better than the above figures, which are the results of one test. At present 28 shafts in the Pittsburgh district are producing, and the output for the year 1889 was 1,320,000 tons. The labor employed amounts to 2200 men in the mines. This vein runs from Columbus in a northwesterly direction for about 30 miles. The coal is obtained at different depths from the outcrop to 120 feet.

In the fall and winter a considerable quantity of mining is done by farmers, who strip the coal for local consumption. The vein averages 36 inches in thickness. The importance of this deposit cannot be overestimated, since almost the whole of the State of Kansas is a treeless prairie and fuel is very scarce. It is also of great value from a manufacturing standpoint, on account of its nearness to the zinc and lead deposits of southwest Missouri. It has also the advantage of cheapness, as slack of quality sufficiently good for manufacturing uses can be mined and sold at 40 cents per ton. The output can be increased to a very great extent as the coal is required. At one shaft operated by the Kansas and Texas Coal Company two cars of lump, one car of nut and one car of slack are loaded for shipment every 20 minutes.

The most important industry, after coal mining, in Pittsburgh is zinc smelting. The zinc and lead mines of the Joplin and Galena districts lie 30 miles to the south, and it is more economical to bring the ore to Pittsburgh than to take the coal to Joplin, since three cars of coal are required to smelt one car of ore. It is upon this fact that Pittsburgh bases its claim to supremacy.

The Granby and the three Lanyon smelters are widely known. They operate 32 furnaces. The Weir City Smelter, operating four blocks of furnaces, is just completed, and the Pittsburgh and St. Louis Smelter, also operating four blocks, will blow in October 1. Another smelter for treating silver and other ores is now being erected. This will be operated by the Chick Short Method, and a company with a paid up capital of $100,000 has been organized. The machinery for this smelter is completed and is awaiting the erection of the building, for which contracts were let in September.

A proposition for the erection of another smelter has been recently received by the Commercial Club, or Board of Trade, of Pittsburgh. A company of Eastern men propose erecting at this point a smelter of 30 blocks or 60 furnaces, and ultimately to add a zinc and lead rolling mill and white lead works. Zinc at present is shipped out in the form of blocks or spelter, and the new works will furnish an entirely new industry for Pittsburgh. The company who make the proposition are largely interested in Southwest Missouri mineral lands, and they have a large surplus capital on which to draw. They have organized to locate somewhere in this district, and it is thought Pittsburgh will be the location. The output of the smelters for 1889 was 26,400,000 pounds, and the output for 1890 will be about 30,000,000 pounds. Clay for making the retorts used in smelting is found in large quantity in the immediate vicinity.

A bonus of $100,000 was raised by the merchants of the town, and was used to induce manufacturers to locate there. This fund is now exhausted, but an improvement company have been organized with a capital of $1,000,000. This capital stock is used as an aid to manufacturers locating there, but not as a bonus. The Improvement Company pledge themselves to subscribe a certain percentage to the capital stock of any legitimate company who will come in. The percentage is based on the number of men employed. The capital stock of the new organization thus taken then becomes a portion of the capital stock of the Improvement Company. It is thought that it is a better plan than a bonus, as nothing is paid unless the company locate and the Improvement Company have a direct interest in the success of the new concern. As a further inducement, a guarantee of abundant coal for 20 years is given. The Commercial Club, which is similar to a board of trade, is composed of the merchants of Pittsburgh, working with the Improvement Company in their efforts to bring in new enterprises.

The location of Pittsburgh is favorable to manufacturing. The distance to the western iron mines of Missouri is only 150 miles, and to the extensive timber lands of Northwest Arkansas from 50 to 100 miles. The Pittsburgh Town Company are interested with the Improvement Company in advancing the interests of the town. This company is made up of local and St. Louis parties whose interests are in Pittsburgh, and who will assist those who locate there for the purpose of doing business. Their interests in Pittsburgh are looked after by A. W. Gifford, who is the general manager for that company at that point.

* Read at a dinner given October 31 by James A. Burden, New York.

OBITUARY.

ROBERT H. LEWIS.—Many of our readers are well acquainted with the subject of this notice. Robert H. Lewis was one of the best known men in the Western iron trade. He was a man of large experience in the iron business, having been connected at different times with a number of important establishments. He was engaged in the manufacture of iron all his adult life. Among the establishments enjoying at different times the benefit of his services are the Pittsburgh Bolt Works, Park, Bro. & Co., the Lake Erie Iron Company, the Sandusky Steel and Iron Works and the Calumet Iron and Steel Company, of Chicago. The last named concern was the latest enterprise with which Mr. Lewis was connected. He severed his relations with that company about 15 months since. For some time he maintained an office in New York. His health becoming impaired he removed to Cleveland, where he died on the 27th ult., aged 51 years. Mr. Lewis was a man of fine executive ability, unusual practical knowledge, exceptionally popular among employees, and remarkably engaging in his social qualities. His untimely death will be deplored by all who had the pleasure of his acquaintance.

JOHN W. CLARKSON, for nearly 20 years the popular and efficient representative in New York of Morris, Wheeler & Co. and the Pottstown Iron Company, died very suddenly from heart disease on Wednesday last. The deceased was widely known to the trade, and his unlooked for death is deplored by a large circle of friends. His remains were taken to Philadelphia for interment. Mr. Clarkson was a widower and leaves two young children.

The annual meeting of the United Forge Masters' Association was held in this city some time since. The following officers were elected for the ensuing year: Capt. L. M. Coe, Cleveland, president; W. S. Sizer, Buffalo, vice-president; F. L. Alcott, Cleveland, commissioner; Executive Committee: Joseph Howard, Buffalo; W. F. Pinkham, New York; J. Johnson, New York. President Coe delivered an address, from which we take the following: "It gives me great pleasure to meet again the members of this association at the beginning of another year in the history of our body. The expectations of the friends of our union and society have been more than fulfilled, and we look with pride and satisfaction at the public and private benefits that have resulted in securing higher perfection in our productions, as well as a more uniform standard of excellence. Instead of a sharp competitive strife as to which of us can furnish the largest amount or the cheapest work in the market, resulting oftentimes in the production and sale of imperfectly manufactured articles, the greatest efforts have been put forth to secure to the public the finest and most perfect forge materials known to science or the trade. The United States now takes it place among the foremost manufacturing countries in the world in this our special branch of industry. Our heavy forgings are unsurpassed in excellence, and now float in

every inland sea and ocean in almost every part of the globe. Let it be in the future our highest object to extend and perfect our manufactures, avail ourselves of every new improvement in our forgings that will add to their strength and durability and usefulness."

The Selection and Use of Emery Wheels.

The Brown & Sharpe Mfg. Company have just issued a very complete pamphlet (which they have copyrighted) on the above subject. As it embodies many points not heretofore brought out, and as it deals with the subject from a practical standpoint, we make the following abstracts:

In selecting and using a wheel, we are governed by the character of the metal to be operated upon, the shape and size of the work and the degree of accuracy desired. We have to consider the size of the particles of emery in the wheel, the hardness of the wheel and its width. We also have to determine the speed at which it is to be revolved, and the speed at which the work is to travel or be revolved, and whether or not water is to be used.

For the sake of clearness we refer separately to the various characteristics of wheels, but it should be borne in mind that a wheel should not be selected for a single characteristic, but that each of the essential elements is importantly affected by the others, and that all should be considered in choosing or using a wheel for any desired work.

Wheels are numbered from coarse to fine —that is, a wheel made of No. 60 emery is coarser than one made of No. 100. Within certain limits, and other things being equal, a coarse wheel is less liable to change the temperature of the work and less liable to glaze than a fine wheel. As a rule, the harder the stock the coarser the wheel required to produce a given finish. For example, coarser wheels are required to produce a given surface upon hardened steel than upon soft steel, while finer wheels are required to produce this surface upon brass or copper than upon either hardened or soft steel.

Wheels are graded from soft to hard, and the grade is denoted by the letters of the alphabet, A denoting the softest grade. A wheel is soft or hard chiefly on account of the amount and character of the material combined in its manufacture with emery or corundum. But other characteristics being equal, a wheel that is composed of fine emery is more compact and harder than one made of coarser emery. For instance, a wheel of No. 100 emery, grade B, will be harder than one of No. 60 emery, same grade.

The softness of a wheel is generally its most important characteristic. A soft wheel is less apt to cause a change of temperature in the work or to become glazed than a harder one. It is best for grinding hardened steel, cast iron, brass, copper and rubber, while a harder or more compact wheel is better for grinding soft steel and wrought iron. As a rule, other things being equal, the harder the stock the softer the wheel required to produce a given finish.

Generally speaking, a wheel should be softer as the surface in contact with the work is increased. For example, a wheel $\frac{1}{16}$ inch face should be harder than one $\frac{1}{4}$ inch face. If a wheel is hard and heats or chatters, it can often be made somewhat more effective by turning off a part of its cutting surface; but it should be clearly understood that, while this will sometimes prevent a hard wheel from heating or chattering the work, such a wheel will not prove as economical as one of the full width and proper grade, for it should be borne in mind that the grade should always bear the proper relation to the width.

The width should be in proportion to the amount of material to be removed with each revolution, and, as a wheel cuts in proportion to the number of particles in contact with the work, less stock will ordinarily be removed by a narrow wheel than by one that is of full width. The feed will also have to be finer if a narrow wheel is used.

The quality of the work, as a rule, is improved by using a wheel of full width, if the wheel is soft in proportion. Judgment should be exercised in deciding upon the width of wheel to be used, as sometimes the work is of such size and shape as to make it necessary to use a wheel with a narrow face. Where this is the case, the wheel should, where strength will admit, be only that width throughout, and care should be taken that the grade is kept in the proper relation to the width.

A wheel is most efficient in grinding just at the point before it ceases to crumble. The faster it is run up to this point the more stock will be removed and the more economically the work will be produced. Occasionally, however, it is necessary to run a wheel rather slowly, as the more slowly it runs the coarser it cuts and the less likely it is to change the temperature of the work. As a general rule, on any given stock, the softer the wheel the faster it should be run.

Should a wheel heat or glaze it can often be made somewhat more effective by being run more slowly. On the other hand, if it be too soft it can often be made to somewhat better hold its size and grind straight by being run more rapidly.

The surface speed of the work should be proportionate to the speed of the wheel—that is, other things being equal, if the speed of the wheel is reduced, the speed of the work should be reduced also. The desire is to have the work revolve at such a speed as to allow time for the wheel to cut away the high points on the work. If the work is run so fast that there is no time given for the wheel to cut, but the work is simply crowded against the wheel, the tendency is for the wheel to follow the inequalities in the form of the work and straight or round surfaces are not obtained. When the wheel is not free cutting and the pressure of the wheel against the work is sufficient to cause the work itself to spring or to cause a slight movement of the oil upon the centers the accuracy of the result is impaired.

The coarser or softer and more free cutting the wheel the greater can be the speed of the wheel and consequently of the work. It is, however, not necessary to graduate the speed of the work as closely as the speed of the wheel. The character of the wheel being influenced so readily by a change of speed, it is sometimes essential and often very convenient on universal grinding machines to be able to slightly increase or decrease the speed of the wheel.

The desire in accurate grinding is to have a free cutting wheel and to obtain the proper speeds so that the stock may be removed with the least possible amount of pressure, thus preventing a change of temperature in the work and allowing the high parts to be most speedily reduced.

Thus far we have had in mind the selection and use of wheels for the comparatively small or medium sized work. The requirements in grinding extremely large or long pieces are somewhat different. For example: In grinding a piece of steel 3 inches long, 1 inch diameter, on a universal grinding machine we have indicated that the most absolutely accurate work would be accomplished by selecting a wheel only just hard enough to retain its size while passing six or eight times over the surface of the piece, and we have suggested that such a wheel should be run at a high rate of speed. We have considered rapidity of production as more important than economy of emery. If, however, we should attempt to use such a wheel to grind a piece of steel 1 inch diameter and 3 feet long, it is clear that before the wheel had passed over 2 of the 3 feet it would have ceased to cut.

The problem now is to maintain the diameter of the wheel so as to take a uniform cut over a large area. Each particle of emery must be used as long as possible before being thrown away. A wheel full width and full diameter should be used, and the face should be true, so that as many particles as possible may be brought in contact with the work and each particle be dulled as little as possible while the wheel is passing over the work. The particles may be used a longer time and are not so rapidly thrown away in a hard as in a soft wheel. Accordingly one expedient in grinding large areas is to use harder wheels as the area of the work increases, the speed of the wheels being reduced as the grade is increased.

The loss of fine particles will not decrease the diameter of the wheel as rapidly as the loss of coarser or larger particles. Thus another expedient is to use a finer wheel. A fine wheel can be relatively softer than a coarser wheel, and so with a fine one there need be less pressure between the wheel and the work and there is more certainty of obtaining an accurate surface.

As the length or area of the work increases the feed should be coarser, so that the wheel may travel the entire length or area of the piece while its diameter is practically unchanged.

Water should be used on such classes of work as are injuriously affected by a change in temperature caused by grinding. It should be used upon work revolved upon centers, as in this work a slight change of temperature will cause the wheel to cut on one side of the piece after it has been ground apparently round.

In very accurate grinding it should be remembered that the exactness of the work will be effected by a change in temperature which is not perceptible to the touch.

In very accurate grinding it is also well to use the water over and over again, as by so doing there is less difference between the temperature of the water and that of the work if fresh water is used. For many purposes soda water is the most satisfactory, as it has less tendency to rust the work or the machine.

For internal grinding it is especially important that a wheel should be free cutting and the work revolved so slowly as to enable the wheel to readily do its work. The wheels should generally be softer than for external grinding, as a much larger portion of the periphery is in contact with the work. Their small diameters make it impossible for the proper periphery speed to be obtained, and this must be considered in regulating the speed of the work.

Soft free cutting wheels, such as are made by a number of the companies using the vitrified process, are the best for most purposes. The ideal wheel is the one composed entirely of cutting materials. The width of the wheel should be in proportion to the amount of stock to be removed at each revolution. The wheel should be soft in proportion to the surface in contact with the work. The speed of the wheel should be in proportion to its softness, and the speed of the work should be in proportion to the speed of the wheel.

In the state of Chiapas, Mexico, there are large tracts of fertile land, which, according to the Mexican law, are given gratuitously to citizens who apply for it in conformity with the law. This land is claimed to be equal, to any in Cuba for the culture of sugar and tobacco.

TRADE REPORT.

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, November 5, 1890.

The month just ended was a period of very heavy trade in all lines. Numerous houses report October to have been the best month in their history. The year has been phenomenal in this respect. Month after month has exceeded all previous records in volume of business. November shows up quite well so far, but there are some indications of the pace slackening. In the opinion of the best posted men in the trade a period of dullness in November and December will be followed by a renewal of activity of even greater proportions than has yet been seen because of the multiplicity of new enterprises now in sight. The only flaw in the situation is the financial stringency, which it is hoped is only temporary.

Pig Iron.—The leading sellers report a good week's business and more orders in sight, but with the majority trade has been somewhat quiet Concessions have been made on some odd lots of Northern low grade Coke Iron, and the knowledge of such sales is being used by buyers to hammer prices on regular transactions, but with little effect. Furnaces are too well sold up at present to give way. A prominent feature of the situation is the decided shortage of stocks in consumers' hands. Large melters are borrowing from one another, and furnace agents are constantly harassed by requests for sharper deliveries. The scarcity of cars is, of course, the main trouble, but consumers themselves are also to blame, because they have purchased too sparingly. The statement that Chicago has bought Bessemer Iron in the Mahoning and Shenango valleys is denied here. The imputed purchasers would be glad to sell such Iron, and it is scarcely probable that they would buy any under the circumstances. More inquiry from speculators is reported, but thus far buyers and sellers have not agreed upon terms. Charcoal Iron has been very quiet, but no special weakness has developed. We make the following quotations, cash, f.o.b. Chicago:

Lake Superior Charcoal	$19.00	@	$19.50
Local Coke Foundry, No. 1	17.00	@	.. ..
Local Coke Foundry, No. 2	16.00	@	....
Local Coke Foundry, No. 3	15.00	@	15.25
American Scotch	18.00	@	19.00
Southern Coke, No. 1	16.25	@	.....
Southern Coke, No. 2	15.75	@	....
Southern Coke, No. 3	15.00	@	....
Southern, No. 1, Soft	15.75	@	.....
Southern, No. 2, Soft	14.75	@	....
Southern Gray Forge	14.75	@	.....
Southern Mottled	14.25	@	....
Tennessee Charcoal, No. 1	18.50	@	.....
Alabama Car Wheel	22.25	@	23.50

Bar Iron.—Several orders from car works and some small lots for jobbers constitute the business of the past week. The steady buying by all classes of consumers has ceased, and trade now is of a spasmodic character. At the moment all the mills are quite well supplied with work, but they are looking to the future with a great deal of interest, and prices are giving way even with those who were stiffest but a fortnight since. The range of the market is still 1.80¢ @ 1.85¢, half extras, Chicago for mill lots, and 2¢ @ 2.10¢, full extras, from store.

Structural Iron.—Structural Iron is in good demand from contractors and builders, who are hurrying to close in work before cold weather appears in earnest. Otherwise the trade of the week has been light. Quotations, f.o b. Chicago, in carload lots, are as follows: Angles, 2.35¢ @ 2.40¢; Tees, 2.90¢ @ 3¢; Beams, 3.20¢; Universal Plates, 2.45¢ @ 2.50¢; Sheared Plates, Iron, 2.50¢ @ 2.60¢; Steel, 2.60¢ @ 2.70¢; Beams sell from store in small lots at 3.70¢, but Angles and Tees at 10¢ @ 15¢ ℔ 100 above carload prices.

Plates, &c.—Renewed activity is reported in this line. Mill orders and stock sales have been quite heavy. Prices are very firm, but unchanged. Some large specifications are in the market.

Sheet Iron.—Trade has been quiet recently in Black Sheets, but the advent of cold weather will work a decided change. No. 27 Common is still quoted at 3¢ at mill and 3.3¢ @ 3.4¢ from store. Galvanized continues in unabated demand, and is firmly held at 60 and 5 % for small lots of Juniata.

Merchant Steel.—Trade now consists mainly of stock sales, with only an occasional carload order. The volume of business is nevertheless very good and prices are steadily maintained.

Old Rails and Wheels.—Old Iron Rails are quiet. They have been sold at other points considerably lower than the equivalent of the nominal price here, which is $26. They are by no means abundant, but buyers seem to be well supplied. Old Steel Rails and Car Wheels are equally dull. The former are quoted at $17 @ $21, according to length, while the latter are held at $18.75 @ $19.

Metals.—Lead has been quiet since our last report. Consumers are well supplied, and refiners are also well sold up. Sales for short delivery have been made at 5.35¢ @ 5.40¢, and futures in limited quantities at 5.25¢, carloads. Copper and Spelter are unchanged.

Rail Fastenings. — Splice Bars not quite so strong as last week, worth 2.05¢ for Iron and 2.25¢ for Steel. Spikes are still quoted $2.30 @ $2.35 and Bolts with Hexagon Nuts 3.10¢.

Scrap.—Scrap is in more demand, so far as Forge and Mill are concerned, but low grade stock is dull, while Steel is absolutely neglected. Dealers' selling prices ℔ net ton are as follows: No. 1 Railroad, $21 @ $22; No. 1 Forge, $21; No. .1 Mill, $16; Fish Plates, $23.50; Axles, $26; Horse Shoes, $19.50; Pipes and Flues, $15; Machinery Cast, $13.50; Cast Borings, $9; Wrought Turnings, $12.50; Mixed Steel, $13; Coil Steel, $16; Leaf Steel, $17; Old Tires, $19.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., November 4, 1890.

Pig Iron.—The demand has been quite equal to that of several preceding weeks, so that prices are firm at the figures recently ruling. There is a sharp competition for business, and a considerable disparity in quotations, but consumers consider that the difference in quality is just about equal to the difference in prices. Competition for business, therefore, is not so much because of an oversupply of Iron, but rather to introduce certain brands, and to secure a footing with consumers who have hitherto been using other brands. Thus, in addition to local makes, there are brands from Ohio, from Central and Western Pennsylvania, from Virginia, Tennessee, Alabama and one or two other States. Some of these are well established, while others are being handled with that object in view. The urgency to effect sales depends in a measure on the supply at the various points; sometimes one Iron is pushed, sometimes another; but at the moment there is no special pressure from any direction. Those who have hitherto controlled certain trade are, of course, doing their best to retain it, while those who are competing for it are not in a position to cut prices to any extent, as they are already so low that there is no room for further concessions. This fact, in connection with the enormous consumption, has prevented any decline, and from present appearances these conditions are likely to continue indefinitely. Production is too great to permit of any advance, and consumption is too large to permit of any decline. The range of prices for the different grades may be given for lots delivered in consumers' yards as follows:

Ohio Softeners, No. 1x	$19.00	@	$19.50
Ohio Softeners, No. 2x	....	@	18.50
Standard Penna, No. 1x	18.00	@	18.50
Standard Penna, No. 2x	17.00	@	17.50
Medium Penna. No. 1x	17.50	@	18.00
Medium Penna, No. 2x	16.50	@	16.75
Virginia and Southern, No. 1x	17.00	@	17.50
Virginia and Southern, No. 2x	15.75	@	16.25
Standard Neutral All Ore Forge	15.00	@	15.50
Ordinary Forge Cinder mixed	14.00	@	14.75
Charcoal Car Wheel Iron	22.00	@	26.00

Bessemer Pig.—Business is still in abeyance, neither buyers nor sellers showing any disposition to force matters. The feeling is a shade better, however, and if buyers should require to place orders, it is probable that they would find $18.50, at furnace, an inside figure, and not much for sale at that price. For the present, however, it is all a matter of guesswork, and in the absence of actual transactions prices are entirely nominal.

Steel Rails.—There is a good deal more inquiry for Rails, and the prospect appears to be more encouraging than it has been for some time past. The Union Pacific Railway Company are in the market for 68,000 tons for delivery during the first quarter of the coming year, which, with other inquiries from leading roads, will do a good deal toward filling up the vacant spaces during the period named. Prices are unchanged, but there is a better tone to the market, and it is thought that only very moderate concessions would be made from $30, at mills, which is the usual quotation for the ordinary run of business.

Steel Billets.—There is a better feeling in this department, although prices still show a great deal of irregularity. Some of the Nail Companies are said to be refusing lots at much less than quoted rates, while in other cases sellers deline to consider bids of anything less than $29.50 @ $30, f.o.b. cars at their own mills. Under these contradictory reports it is difficult to say what the market really is, although $30.25 @ $31, delivered, for Slabs and Billets, appear to be the usual asking prices, and so far as known latest actual sales were on this basis.

Muck Bars.—The market is firm at about $30, delivered, some makers asking that price at their own mills. Sales have been at $30, delivered, however, and so far as known nothing beyond that has been paid within the past few days. But there are more buyers than sellers at this figure, as several parties have been in the market without being able to place their orders satisfactorily as regards quality, price and delivery.

Bar Iron.—There is a good deal of business around, although some of the mills are not as full of work as they were some time ago, and to secure the right kind of orders very slight concessions in prices have been made. But there is a good market, nevertheless, and at about 1.80¢ @ 1.85¢ f.o.b. cars at country mills, or 1.90¢ @ 1.95¢ in the city, there is plenty of business, subject, as we have said, to slight concessions for specially desirable orders. Consumers appear to be as busy as ever, and as far as can be seen, there is no reason to expect any material change from the conditions which have prevailed for some time past.

Skelp Iron.—The demand is still very active, and in some cases extreme outside figures have been paid for early deliveries. Ordinary quotations are from 2¢ to 2.05¢, delivered, for Grooved Skelp, and 2.15¢ to 2.25¢ for Sheared.

Plates.—There is a very good general demand, but there are no specially large lots on the market at present. Mills are well employed for the present, however, with very fair prospects for its continuance during the winter months. Prices are slightly easier, but as a rule the following quotations are given for lots delivered in consumers' yards:

	Iron.	Steel.
Ship Plates	2.25 @ 2.30¢	2.40 @ 2.50¢
Tank	2.20 @ 2.25¢	2.40 @ 2.50¢
Bridge Plate	2.30 @ 2.40¢	2.50 @ 2.60¢
Shell	2.45 @ 2.55¢	2.70 @ 2.80¢
Flange	3.10 @ 3.20¢	3.00 @ 3.10¢
Fire-Box	3.75¢	3.75 @ 4.25¢

Structural Iron.—Business continues to be very active in this department, although the amount entered is hardly as large as it was some time ago. Mills have so much work on hand, however, that a few weeks of dullness would not make very much difference, as they have plenty to go on with. Prices are firm, and for lots delivered in consumers' yards are about as follows: Angles, 2.20¢ @ 2.30¢; Sheared Plates, 2.30¢ @ 2.40¢, and from 10¢ to 20¢ more for Steel, according to requirements. Tees, 2.7¢ @ 2.8¢; Beams and Channels, 3.1¢ for either Iron or Steel.

Sheet Iron.—There is no material falling off in the demand, so that full employment to the close of the year may now be considered certain. Prices firm, and for carload lots of best makes quotations are about as follows:

Best Refined, Nos. 14 to 20	3.00¢ @ 3.10¢
Best Refined, Nos. 21 to 24	3.20¢ @ 3.30¢
Best Refined, Nos. 25 to 26	3.40¢ @ 3.50¢
Best Refined, No. 27	3.50¢ @ 3.60¢
Best Refined, No. 28	3.60¢ @ 3.70¢
Common, ¼¢ less than the above.	
Best Soft Steel, Nos. 14 to 20	3¼¢ @ 3½¢
Best Soft Steel, Nos. 21 to 24	3⅜¢ @ 3¾¢
Best Soft Steel, Nos. 25 to 26	3¾¢ @ 3⅞¢
Best Soft Steel, Nos. 27 to 28	@ 4⅛¢
Best Bloom Sheets, 1-10¢ extra over the above prices.	
Best Bloom, Galvanized, discount	@ 60 %
Common, discount	62½ @ 65 %

Old Rails.—Business in this line is limited, owing to the very light supplies. Buyers are not offering more than $25.50 at seaboard, or $26 @ $26.50 in the interior, and what little business there is is chiefly at about the figures named.

Scrap Iron.—The demand is well maintained, and sales are chiefly at full quoted rates, as follows: No. 1 Railroad Scrap, $23 @ $23.50, Philadelphia, or for deliveries at mills in the interior $23.50 @ $24.50, according to quality and point for delivery; $15 @ $16 for No. 2 Light; $16 @ $17 for best Machinery Scrap, $15 @ $15.50 for ordinary, $15.50 @ $16.50 for Wrought Turnings, $11 @ $11.50 for Cast Borings, and nominally $26 to $28 for Old Fish Plates, and $17 @ $18 for Old Car Wheels.

Coke.—There is a good business doing at figures named in our last report, viz.: $2 @ $2.15 for Connellsville and $1.85 @ $1.95 for outside Coke.

Wrought Iron Pipe.—The volume of business is very large, and there appears to be no abatement in the steady demand of the past few weeks. Prices are firm, and discounts unchanged, as follows: Butt-Welded Black, 47½ %; Butt-Welded Galvanized, 40 %; Lap-Welded Black, 60 %; Lap-Welded Galvanized, 47½ %; Boiler Tubes, 1¾ inches and smaller, 45 %; 2 inches and larger, 50 %; Oil Well Casings, 50 %.

Justice Cox, Jr., & Co., 224 South Fourth street, have been appointed sales agents for the Princess Furnace, the product of which is well and favorably known, especially to consumers of Foundry Iron.

L. & R. Wister & Co. have been appointed agents for the Lickdale Iron Company, of Lebanon, Pa., for the sale of Billets, Nail, Slabs, &c.

Detroit.

WILLIAM F. JARVIS & Co., Detroit, Mich., under date November 3, 1890, write as follows: There is a decidedly mixed condition of affairs in the Pig Iron market here. There can be no doubt but that certain grades of metal are as weak as the greatest pessimist could desire. To offset this to a certain degree, a very refreshing strength is seen where the demand is confined to Lake Superior Charcoal and Northern Silvery Irons, which have been quite eagerly sought for. Statisticians are puzzled to know why lower figures should exist with stocks in makers' hands growing smaller continually. The turn for better prices cannot now be long postponed with the present immense consumption and active buying continuing. There were several transactions in Southern Foundry and Forge Iron at very low figures, and a number of deals for Lake Superior and Silvery Iron closed, though smaller in tonnage than the Southern Iron, at full figures. We quote the market figures here to-day as follows:

Lake Superior Charcoal, all numbers	$20.00 @ $20.50
Lake Superior Coke, Bessemer	18.50 @ 18.75
Katahdin (Maine Charcoal)	23.50 @ 24.00
Lake Superior Coke Foundry, all ore	18.50 @ 19.50
Ohio Black Band (40 per cent.)	18.25 @ 18.75
Southern No. 1	16.50 @ 17.00
Southern Gray Forge	14.50 @ 15.00
Jackson County (Ohio) Silvery	19.00 @ 19.50
Connellsville Coke	4.80 @ .....

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, PITTSBURGH, November 4, 1890.

The supply of natural gas for fuel continues inadequate to meet the wants of the mills, and a number are making arrangements to use coal again. Until this change is made the output both of Iron and Steel must continue light. Some firms having their own private gas wells still have a good supply, and it is probable that others who heretofore have been supplied by the Philadelphia and other companies will buy territory and have their own gas, so that they will not be at the mercy of corporations who can turn their supply off without giving more than a few days' notice. While the supply is short at present, there is not much danger of it giving out, as new gas fields will be opened up just as new oil territory is being developed.

Pig Iron.—There is an increasing demand, but no improvement in prices. While Foundry and Mill Irons remain about the same as a week ago, Bessemer Pig is lower. Some furnacemen are refusing to sell at present prices, but consumers are able to supply themselves, and the reason the former are refusing to make additional contracts is because they are well sold ahead and in a position to be independent. Other furnacemen, not so fortunate, who are weak financially and have payments to meet, are forced to sell as best they can; these latter are, to a large extent, responsible for the recent sharp decline. Consumers are more disposed to anticipate future wants, feeling, as they do, that there is not much risk in so doing. Prices may be fairly quoted as follows:

Neutral Gray Forge	$14.75 @ $15.00,	cash.
All Ore Mill	15.50 @ 16.00,	"
White and Mottled	14.00 @ 14.25,	"
No. 1 Foundry	17.00 @ 17.25,	"
No. 2 Foundry	16.00 @ 16.25,	"
No. 3 Foundry	15.50 @ 15.75,	"
No. 1 Charcoal Foundry	24.00 @ 24.50,	"
No. 2 Charcoal Foundry	22.00 @ 22.50,	"
Cold Blast Charcoal	27.00 @ 30.00,	"
Bessemer Iron	16.75 @ 17.00,	"

Included in the sales of Bessemer reported was one of 7000 tons at $17, cash, and another of 2000 at $16.75. Rumor still has it that there is an organized movement to bear the market for Bessemer Pig, and there may be something in it.

Muck Bar.—There is possibly more offering and not so much anxiety on the part of consumers to anticipate future wants. We continue to quote at $31 @ $31.50, cash, for November and December. There are fewer buyers beyond December, as buyers are looking for lower prices.

Manganese—Continues very dull; consumers are refusing to buy beyond their immediate actual wants, and this is not surprising in view of the recent sharp decline—they have no assurance that the lowest point has been reached. Small sales of domestic 80 % at $71 @ $72, for immediate or near-by delivery.

Manufactured Iron.—Demand continues good and mills are all very busy; few of them are in a position to take orders for immediate or near-by delivery. Prices remain unchanged: Bars, 1.85¢ @ 1.90¢; Tank and Plate, 2.20¢ @ 2.25¢; No. 24 Sheet, 2.85¢ @ 2.90¢; Grooved Skelp, 1.85¢ @ 1.90¢; Sheared Skelp, 2.20¢ @ 2.25¢, all 60 days, 2 % off for cash.

Nails.—The Cut Nail trade continues dull, and there does not appear to be much prospect of any immediate improvement. Not only is the demand light, but there is little or no profit at the prices. There is a good demand reported for Wire Nails, and prices have ruled steady for several weeks past at $2.25, 60 days, 2 % off for cash. We have three Wire Nail factories all in operation, but not a single one of the Cut Nail works. It looks very much as if the latter, so far as Pittsburgh is concerned, was a thing of the past.

Wrought Iron Pipe.—The activity in this branch of the Iron business continues. Mills are all crowded, and their output has been more or less curtailed of late by a shortage of gas, which was exceedingly annoying. Prices remain unchanged. Discounts on Black Butt Weld, 47½ %; Galvanized do., 40 %; Black Lap Weld, 60 %; on Galvanized do., 47½ %; Boiler Tubes, 1¾-inch and smaller, 45 %; 2-inch and larger, 50 %; Casing, all sizes, 50 %. The regular monthly meeting of the association takes place Wednesday, in New York, but it is not expected that there will be any change made in prices.

Old Rails.—There is rather more inquiry reported by some of the brokers, but the prices remain unchanged at $27.75 @ $28. Most of the inquiry comes from the Shenango and Mahoning Valley mills. Old Steel Rails continue very dull, and for remelting purposes may be quoted at $19 @ $19.50.

Merchant Steel.—There is continued activity reported. No change in prices. Tool Steel, 8¢ and upward; Crucible Spring Steel, 4¢; Crucible Machinery Steel, 5¢; Open Hearth Steel, base sizes, 2¾¢ @ 3¢; Bessemer Machinery Steel, 2.40¢ rates; Tire Steel, 2.55¢ rates.

Structural Iron.—The demand is reported to be good, and mills making a specialty of this kind of work are very busy. Prices steady, but unchanged, as follows: Angles, 2.30¢; Beams and Channels, 3.10¢; Tees, 2.85¢; Steel Bridge Plates, 2.65¢ @ 2.70¢.

Steel Plates.—There is nothing new to report; mills busy and will be for some time to come. No change in prices: Fire Box, 4.25¢ @ 4.75¢; Flange, 3.10¢ @ 3.20¢; Shell, 2.90¢; Tank, 2.50¢ @ 2.55¢.

Wire Rods—Continue offish, and we now quote at $40, cash, f.o b. at maker's mill. It is evident that the demand is light.

Billets and Slabs.—The market for Billets continues unsettled and somewhat demoralized, while we give $27.50 @ $28, casb, at makers' mill, as the general asking prices, it is intimated that under the influence of an active competition sales

have been made as low as $27. There are a good many buyers holding back, and just as soon as there is a reasonable assurance that the lowest point has been reached there will be some large orders on the market.

Steel Rails.—There has been but little new business placed here of late, and in the absence of sales it is difficult to quote accurately. While $29 @ $29.50, cash, at mill appears to be regarded as bottom, we have heard rates considerably below inside quotation quoted. Now is a good time to buy, as the mills are anxious for orders.

Railway Track Supplies.—There is a continued fair business, but prices remain unchanged. Spikes, $2.20, 30 days; f.o.b. at makers' works; Iron Splice Bars, $1.95 @ $2.05; Steel Splice Bars, $2 @ $2.10; Iron Track Bolts, $2.90 with Square and $3 with Hexagon Nuts.

Old Material.—There has been nothing new developed in this line during the past week. Business generally reported slow, with but little change in prices.

Connellsville Coke.—There is a continued complaint in regard to scarcity of cars. Prices unchanged, and the same is true of freight rates.

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, November 3, 1890.

Pig Iron.—We have not been able in the past week to discern any change in the tone of the market. The furnaces are running full, and have sufficient contracts ahead to keep the yards clear. Prices are fully maintained, without any disposition on the part of the furnaces to raise prices, or on the part of the buyers to ask conceded figures. The general opinion appears to be that bed rock in prices has about been reached, and furnaces are growing quite conservative about making contracts for large round lots, especially for long time delivery. A few instances have occurred where furnaces have positively refused offers at the present prices for long time future delivery. The general opinion appears to be that prices will remain as they are during the balance of this year.

Cincinnati.

(*By Telegraph.*)

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, November 4, 1890.

Pig Iron.—Nothing has occurred to change the temper of the local market for Pig Iron during the past week, yet record is made of a number of sales of both Northern and Southern brands of Coke Iron at even lower prices than any reported for many weeks. That some of these rumors are unreliable is unquestioned, but that others have the foundation of truth is probable. One or two denials have been made of previous sales reported at cut prices, but the majority are accepted as fact. Some of the sales which appear low, however, when regarded from a Birmingham basis, are not actually so to the furnace making the sales, because of the advantage of position held by such stacks in some cases. When pressed by close competition with more remote stacks producers have given sellers advantages in freight, which is their special protection, and from this practice has grown the report of cut prices; and indeed, as far as the far away stacks are concerned, it is a cut. At the same time, the strongest furnaces, or rather companies, in the South have again advanced prices 25¢ ₱ ton. Reports from the consumers continue encouraging, and the opinions of those who have had large experience in business matters are favorable for an active trade in all important branches throughout the winter, and especially actively industries dependent upon Iron and Steel. Among some of the sales of importance reported during the week are 2000 Mottled on basis of less than $10, cash, at Birmingham; 1000 tons Gray Forge on a basis of less than $10.25, cash, at Birmingham; 1000 No. 3 Foundry on basis of less than $11.25, cash, Birmingham; 2000 tons No. 3 Foundry and Gray Forge together at less than $10.50, cash basis, Birmingham, and 2000 tons Southern Gray Forge at $10.20, cash, Birmingham; 1000 tons Gray Forge at $10.37½, and 900 tons No. 3 Foundry at $11.25, cash basis, at furnace. Other sales of moment have also been made, in which full prices have been obtained, and indeed there is more of a general disposition at the close to demand full market rates. A few plants, however, under pressure of financial need, are sufficient to create distrust. Charcoal brands have been especially slow recently, and the demand for Softeners has been only moderate. We quote the prices current for cash, f.o.b. Cincinnati, as follows:

Foundry.	
Southern Coke, No. 1	$15.25 @ $15.75
Southern Coke, No. 2	14.25 @ 14.50
Southern Coke, No. 3	13.75 @ 14.00
Ohio Soft Stone Coal, No. 1	17.00 @ 17.50
Ohio Soft Stone Coal, No. 2	16.00 @ 16.50
Mahoning and Shenango Valley	17.50 @ 18.00
Hanging Rock Charcoal, No. 1	21.00 @ 22.00
Hanging Rock Charcoal, No. 2	19.50 @ 20.50
Tennessee and Alabama Charcoal, No. 1	18.00 @ 19.00
Tennessee and Alabama Charcoal, No. 2	18.50 @ 19.50
Forge.	
Gray Forge	13.25 @ 13.50
Mottled Neutral Coke	12.75 @ 13.00
Car Wheel and Malleable Irons.	
Southern Car Wheel	22.50 @ 23.50
Hanging Rock, Cold Blast	22.00 @ 22.50
Lake Superior Car Wheel and Malleable	21.00 @ 22.00

Cleveland.

CLEVELAND, November 3, 1890.

Iron Ore.—The shipping season is almost over. Many vessels will tie up this week, while a few of the stancher boats will be kept running until about the last of the month. The shipments for the season are not unlikely to reach 7,900,000 tons, and may touch the 8,000,000 mark. The latter figure was prognosticated in these quotations early in the spring, and but for the provoking blockade at the "Soo" and the unlooked for strike at the mines would have been passed long before this time. Several producers are still considerably short of their sales, and are urging the vessel owners to keep their craft in commission as long as possible. If the weather does not become too boisterous during the next three weeks it is possible that 600,000 tons of Ore may yet be sent down from the mines, which, added to the 7,400,000 tons already unloaded at the docks, will bring the total lake shipments up to 8,000,000. The demand for Bessemer Ores from the Eastern furnaces is so great that an effort is being made to induce the railroad companies to fix an Ore rate that will warrant sales of 800,000 or 1,000,000 tons of Ore for winter shipment. There is again plenty of cars for the trade between the docks and the furnaces, and stock piles at the lower lake ports are being rapidly reduced. There have been a few sales of odd lots during the week, but at prices quite out of harmony with those prevailing a year ago, when most of this season's output of Ore was sold. These latter day purchases were in small quantities, and the prices asked by the dealers were seldom disputed. All of the talk concerning next season's sales is in favor of lower prices—lower enough at any rate to allow the furnacemen some margin on their products.

Pig Iron.—The excitement attendant upon an important election, in which, naturally enough, the Iron men feel a personal interest, is diverting attention from the market just at present. It may be remarked in parenthesis that this attention can just at the present time be spared. Indeed since the market is so entirely devoid of noteworthy features these attentions will not be missed. There have been sales—plenty of them—during the past week, but at prices that mean nothing to the furnacemen. Ohio Silvery Irons are the only ones commanding even fair prices. Sales of Forge Irons have been made at $14, cash, at the furnaces. No. 1 Foundry is quoted at $16, and No. 2 Foundry $15, on the same terms. There have been sales of Bessemer as low as $16.50 at the Valley furnaces, although $17 is said to have been paid for odd lots. Something better is looked for soon, but just how soon is one thing, as Francis Wilson would say, that nobody knows.

Manufactured Iron.—The mills are simply overcrowded with orders. Common Bar is firm at 1.80¢ @ 1.85¢, and Muck Bar is equally strong at $30.50. All kinds of Structural Iron are high, and Sheets are not only scarce, but valuable.

Scrap.—The market is not particularly strong. No. 1 Railroad Wrought is selling at $21 @ $21.50. No. 1 Forge, $20.50 @ $21; Old Car Axles, $26 @ $26.50; Machinery Cast, $13 @ $13.50, and Wrought Turnings, $13.

Old Rails.—The demand is fair, but prices are still out of proportion to the condition of affairs prevailing in the Pig Iron market. Sales at $27.50 are reported.

St. Louis.

OFFICE OF *The Iron Age*, 214 N. Sixth st., ST. LOUIS, November 3, 1890.

Pig Iron.—Transactions during the past week have been on a limited scale; the only sale of any moment was 2500 tons Car Wheel Iron on a basis of $19.50, f.o.b. St. Louis. Ordinary sized lots have been taken at current rates, and while the market has not materially improved so far as prices are concerned, there is a tendency to adhere more firmly to current rates, and in some instances furnaces have refused to accept prices which were from 25¢ to 35¢ less than quoted below. The demand for Foundry grades continues heavy, and full prices are obtained for all sales made of these Irons. Consumption keeps up remarkably well, and furnaces in some cases are considerably behind in their orders. Looking at the market from a buyer's standpoint, it seems that purchases made to-day would prove good investments, but there are some who think that a still lower range of value will prevail before the market takes an upward turn. We quote as follows for cash, f. o. b. St. Louis

Southern Coke, No. 1 Foundry	$15.75 @ $16.25
Southern Coke, No. 2 Foundry	14.75 @ 15.25
Southern Coke, No. 3 Foundry	14.25 @ 14.75
Gray Forge	13.75 @ 14.25
Southern Charcoal, No. 1 Foundry	17.50 @ 18.00
Southern Charcoal, No. 2 Foundry	17.00 @ 17.50
Missouri Charcoal, No. 1 Foundry	16.00 @ 16.50
Missouri Charcoal, No. 2 Foundry	15.50 @ 16.00
Ohio Softeners	18.00 @ 19.00

Bar Iron.—There is nothing particularly new to note in this department. The demand, while not quite so heavy as a few weeks ago, is of such a character as to keep the mills comfortably employed. Prices are strictly adhered to, as follows: Lots from mill command 1.95¢; small lots from store are quoted at from 2.10¢ to 2.15¢.

Barb Wire.—A fair amount of business is received and mills are enabled to keep their warehouses only moderately filled.

At this period of the year dullness is generally expected, but mills have no reason as yet to complain regarding the demand. Prices have reached a level that makes Wire a good article to purchase, and jobbers who generally buy in limited quantities at this season of the year have recently purchased quite freely, presumably to take advantage of the low prices at which Wire is offered, viz.: Painted, 2.80¢; Galvanized, 60¢ additional; carload lots 5¢ ₱ cwt. less than above prices.

The Hattie Ensley Furnace, owned by Col. Enoch Ensley, has made what is considered a remarkable run, turning out 180 tons of Iron. This is a 125-ton furnace, and the record of 180 tons for one day's work is hard to excel.

Louisville.

LOUISVILLE, KY., November 3, 1890.

Pig Iron.—The market in this immediate vicinity has been very quiet during the past week; what few sales have been made were at a distance and for delivery during the first six months of next year. There has been no change in prices; $10.50 for Gray Forge, Birmingham. There are parties in the market for a large amount of Iron, but they desire delivery during all next year. Some buyers profess fear that the reported weakness of Steel and Much Bar indicates that before long production will exceed consumption, which they believe by the first of next year will fall off. This, however, does not prevent them from buying for legitimate needs on account of the low price of Iron, but curtails purchases in excess of ordinary business requirements. We quote prices as follows:

Southern Coke, No. 1 Foundry	$14.75 @ $15.25
Southern Coke, No. 2 Foundry	14.25 @ 14.75
Southern Coke, No. 3 Foundry	13.75 @ 14.25
Southern Coke, Gray Forge	13.25 @ 13.75
Southern Coke, Silver Gray	14.00 @ 15.00
Southern Charcoal, No. 1 Foundry	17.50 @ 18.50
Southern Car Wheel	22.50 @ 23.50

New York.

Office of *The Iron Age*, 66 and 68 Duane street, NEW YORK, November 5, 1890.

American Pig.—The market has been very quiet during the week under review, the conditions affecting it having undergone no change, except that there are indications of weakness in Southern Iron. A lot of 500 tons of Southern Warrant Iron No. 1 was sold in this market to-day at a price equivalent to $16 here. Bessemer Pig is being offered at $18, at furnace, without finding any buyers. We quote $17 @ $18 for No. 1 Foundry, $16 @ $16.50 for No. 2 Foundry and $15 @ $15.50 for Gray Forge, good Northern brands, tidewater delivery. There is very little No. 1 Southern. No. 2 may be quoted $16 @ $16.25 and No. 3 $14.75 @ $15.25.

Spiegeleisen and Ferromanganese.—There is no business whatever in Spiegeleisen, which is nominally $30 @ $31. The principal feature in Ferromanganese is the demand by consumers that deliveries be delayed. A hand to mouth business only is being done at $68 @ $69. It is reported that small spot parcels are being offered in some instances as low as $66.

Steel Billets.—The principal consumer in the East purchased three months' requirements during the past two weeks from an Eastern mill, which takes the latter out of the market. We quote, nominally, $29.50 @ $30, delivered.

Steel Wire Rods.—We note one sale of 1000 tons by an Eastern Rod mill to a tidewater consumer at private terms, and of a small lot, 250 tons, delivered at a New England point, at $47. We quote Rods at Eastern mill $41.50 @ $42.50. Some parcels of foreign Rods, for re-export, have been sold during the week, the quotations being $45.50 @ $45.75.

Steel Rails.—The event of greatest importance during the week has been the sale of the mill of the Allegheny Bessemer Steel Company, which removes the incentive for the keen rivalry in Pittsburgh, which had latterly carried prices at that point to $28 and under for Steel Rails. In the East the majority of the mills name $29 as the starting point for negotiations, but there have been no sales of any consequence during the past week. There has been considerable activity, however, in light Rails, about 2000 tons having been sold at a shade over $30 for 40's. Some large orders are on the market, among them 10,000 tons for the Atchison, 10,000 tons for a Texas road, 59,000 tons for a transcontinental road and 60,000 for the Great Northern.

Rail Fastenings.—Dilworth, Porter & Co., of Pittsburgh, announce that within the next 30 days they will cease placing on the market any Spikes made of Old Rails, and will manufacture chiefly Spikes made of Soft Bessemer Steel. What Iron Spikes their customers may call for will be made of Muck Bar. The market for Angle Bars has been in a very demoralized condition lately. Not long since a lot of about 900 tons of Steel Angles was sold, delivered in the northern part of the State, at 1.65¢, and last week a lot for 3000 tons of Rails was placed at 1.75¢, Charleston Spikes are $2 @ $2.25, and Bolts and Nuts 2.75¢ @ 3.15¢.

Manufactured Iron.—During the week the order for the Dugro Hotel ceiling for about 1000 tons of Beams was placed. We quote: Angles, 2.20¢ @ 2.40¢; Tees, 2.65¢ @ 2.75¢, and Plates, 2.2¢ @ 2.3, delivered Bars are selling at 1.75¢ @ 1.90¢, delivered, for Refined.

Old Rails.—It is reported that a holder of 1000 tons of Tees and 500 tons of Doubles, carried here for a long time, has disposed of them. The market otherwise is extremely dull at $25 for Tees. Old Steel Rails may be quoted $21. The announcement of Dilworth, Porter & Co., of Pittsburgh, that henceforth they will make Steel Spikes, is very significant as to the future of Old Rails. They were purchasers annually of about 25,000 to 30,000 tons.

Imports.

Hardware, Machinery, &c.

Bloomfield, J. C. & Co., Mach'y, cs., 55
Boker, Hermann & Co., Hdwe., cs., 12; Arms, cs., 32
Clark's Mile End Co., Mach'y, cs., 2
Godfrey, Chas. J., Arms, cs., 4
Hammacher, Schlemmer & Co., Nails, cs., 42
Hampton, J. W. Jr. & Co., Gun Barrels, cs., 17
Isaacs, Vought & Co., Mach'y, pgs., 387
Lau, J. H. & Co., Arms, cs., 12
Matthews, John, Mach'y, box, 1
Mecke & Co., Mach'y, box, 1
Wiebusch & Hilger, Hdwe., cs., 14; ditto, cks, 4; Anvils, 175; Arms, cs., 10
Order—Mach'y, cs., 20; Steel Anvils, 3

Coal Market.

The Anthracite Coal trade is hardly up to expectations, although a large amount of Coal is moving off on account of former contracts. As to prices, the October circular is the best they can hope to realize unless the demand materially sharpens—viz: Egg, $4.30; Stove, $4.45; Chestnut, $4.10. Some claim to have made sales at the latest advance. The prices actually realized are understood to be a shade under these figures. Free Burning Pea Coal and Lehigh Pea are scarce, on account of the active demand by manufacturers, and bring $2.75 @ $2.90 alongside. Buckwheat Coal is in rather better supply at $1.80 @ $2 alongside. Shrewd buyers sometimes succeed in having their wants supplied, ostensibly on "old orders," even where orders are comparatively fresh. The production of Anthracite Coal for the week ending October 25 was 848,311 tons, or 38,504 more than last year, and making the total output for the year to date 28,384,951 tons, being 355,375 tons less than last year.

Reading has been making heavy shipments, those for October being the largest in its history, although it was said to be behind in its allotment, while Erie, Lackawanna and Pennsylvania were ahead. Quotations are:

	Broken.	Egg.	Stove.	Chestnut.	Pea.
Hard White Ash	$3.90	$4.15	$4.30	$3.95	$2.50
Free White Ash	3.75	4.00	4.30	3.95	2.50
Lump and Steamboat	....	....	.....	.....	$4.15

Bituminous Coal is active, with supplies at tidewater below requirements. Vessel freights firmer. Cumberland reports for the week 84,618 tons.

Metal Market.

Pig Tin.—Prices have further declined in both this and foreign markets, and business has been slow, despite more favorable statistics of local supply. Consumers' purchases are apparently governed almost wholly by imperative wants at present, a cautious tendency is apparent in dealers' operations and speculation remains spiritless. The usual monthly statistics show spot supply in America on the 1st inst. to have been 1950 tons, against 800 tons a month previous, and the quantity afloat 1700 tons, against 2750 tons on October 1. In other words, about three months' supply in sight. English spot supplies are shown to have decreased 253 tons, while the quantity afloat for that market increased 920 tons, leaving 667 tons more in sight November 1 than on October 1. The statistical position in detail, as posted on the Metal Exchange, is as follows:

MOVEMENT.

Shipments in October.	1890.	1889.	1888.
Straits to Great Britain	1,300	1,900	1,900
Straits to America	750	700	750
Straits to Continent	450	...	....
Australia to Great Britain	520	300	750
Australia to America	100	100	50
Totals	3,120	3,000	3,450
Deliveries in London	1,330	2,775	2,770
Deliveries in Holland	730	780	590
Shipments, Europe to America	430	437	1,340

SUPPLY.

	Oct. 1, 1890.	Nov. 1, 1890.	Nov 1, 1889.
Foreign in London	2,640	2,387	3,112
Second hands in Holland	2,030	1,280	1,440
On spot, America	800	1,950	700
Totals	5,470	5,617	5,252
Afloat for London	2,230	3,150	3,431
Afloat for Holland	1,300	1,580	1,700
Afloat for America	2,750	1,700	2,035
Totals	6,280	6,430	7,166
Visible supply	11,750	12,047	12,418

On Wednesday's market a rather firmer feeling was manifested, the result of more favorable advices by cable from London. Ten ton lots were held at 21.35¢ @ 21.40¢, net cash, prompt or near future delivery, and for smaller qualities 21.50¢ @ 21.60¢ was quoted.

Pig Lead.—Aarrivals of foreign in delivery on late purchases, together with somewhat freer offerings of domestic for early shipments, have served to bring prices around to a more normal relation. The change has not, however, operated to stimulate business up to the present time. Consumers are still very conservative, as a matter of fact, and look upon current prices as being higher that circumstances fully warrant. Spot quotations have dropped from 5¼¢ to 5¼¢, and both domestic and foreign may now be secured at 5.15¢ @ 5.20¢ for forward delivery. On round lots 5¢ is the highest offer at the present time.

Copper.—The market has been quiet throughout the week, and no new features have developed. Various rumors of contracts for 1891 delivery have circulation, but none are found to rest on solid foundation. For deliveries during the balance of the year there is little demand at present. Outside of supplies from second hands the offerings of Lake are light, but there seems to be an abundance of other descriptions to be had from the producers. Lake is quoted at 17¢ by the mining companies and at 16¾¢ from second hands. There were bids of 16½¢ for this and next month's delivery. Arizona is quoted at 15½¢, and common Casting Copper at 14½¢ for prompt delivery.

Spelter.—Transactions have been confined to single carload lots and the demand at present is slow. The supply on offer is light, however, and prices are held firmly at 6.10¢ @ 6.15¢ for prime Western.

Antimony.—Prices have weakened off to 17¾¢ @ 18¢ for Hallet's and 19¾¢ @ 20¼¢ for Cookson's. The demand has been moderate.

Tin Plate.—The market has been very quiet throughout the week, and without new or interesting feature. Future deliveries are only moderately inquired for and the spot trade is chiefly of retail character except when something may come out in the way of a cheap lot. Quotations for round lots on the spot are as follows: Coke Tins—Penlan grade, IC, 14 x 20, $5.42½ @ $5.47½; J. B. grade, do., $5.50. Bessemer do., $5.50. Stamping Plates—Bessemer Steel, Coke finish, IC basis, $5.45; Siemens Steel, IC basis, $5.50; IX basis, $6.50. IC Charcoals—Calland grade, IX, ——; Melyn grade, $6.12½ @ $6.25; for each additional X add $1.50; Allaway grade, $5.87½; Grange grade, $6; for each additional X add $1. Charcoal Ternes—Worcester, 14 x 20, $5.50; 20 x 28, $10.87½; M. F., 14 x 20, $8; do., 20 x 28, ——; Dean 14 x 20, $5.25; do., 20 x 28, $10.40; D. R. D. grade, 14 x 20, $4.85 @ $4.90; do., 20 x 28, $9.75; Mansel, 14 x 20, $4.95 @ $5; do., 20 x 28, $10; Alyn, 14 x 20, $5.12½; do., 20 x 28, $10; Dyffryn, 14 x 20, $5.75; do., 20 x 28, $10.50; Wasters—S. T. P. grade, 14 x 20, $4.65; do., 20 x 28, $9.50; Abercarne grade, 14 x 20, $4.60; do., 20 x 28, $9.50.

FINANCIAL.

The general elections caused a temporary interruption of business and the volume of transactions is somewhat restricted. But at all principal points there is a remarkable activity, as shown by the excessive amount of merchandise *in transitu* and the continued demand for money. During the week in New York the stringency in time loans has been more perceptible, 6 % being the minimum rate on choice collateral. The principal borrowing is to bridge over the period intervening before the new year. There was absolutely no demand from the city banks for commercial paper, and a very light inquiry from the interior, while the offerings were not abundant. The bank returns of last week showed a gain of $206,500 cash and of $826,850 in reserve, and the banks are now $801,775 above the limit of 25 % reserve to liabilities. As the South is now returning money quite freely and demands from the West are lessened, an improvement in the market for commercial paper is supposed to be near at hand. One result of the scarcity of money has been a general clearing sale of stocks, which has left the market in better shape for actual business. Another effect is to bring down non-dividend stocks to figures more nearly representing their true value. Bonds have in the main been well sustained and are said to be in somewhat better demand.

The main sensation of the week has been the statement of the Sugar Trust, the first yet submitted for public inspection. There is much comment on the fact that this statement leaves the plant entirely out of consideration, its value being entirely contingent upon the future profits of the concern. The exhibit shows that during the two years and 11 months from October 1, 1887, to September 1, 1890. about $12,000,000 was expended in dividends and $2,750,000 for additional property, while quick assets have a surplus of $11,500,000 over liabilities, a total profit of more than $26,000,000 in about three years. While one side asks why a statement of the value of the plant, the property on which the $50,000,000 of stock has been issued, was not given with the reorganization plan, the other side maintains that any absolute valuation would be an arbitrary one, founded on guesswork and individual opinion, and that the true criterion is the earning of the property, which is given.

The stock market was irregular and generally lower. One feature was a raid upon Chicago, Burlington and Quincy. Sugar Trust was generally stronger on the announcement of the reorganization scheme. On Saturday Reading dropped to the lowest point by reason of the liquidation of a pool, and Sugar Trust was heavy. The market closed steadier because the bank statement was unexpectedly favorable.

The merchandise markets have been more quiet, partly due to tight money, which also has its effect in Western markets. Wheat has fluctuated considerably, but on the whole tends to maintain a good deal of strength, with a net gain during the past month. Indian corn stocks are decreasing, and the demand is quite active. Prices have advanced 5½¢ in October. Oats are also up 5½¢. Exports of wheat continue larger than anticipated, owing to a free movement from the Pacific Coast ports. The total shipped, July 1 to date, one-third of the cereal year, approximates 32,750,918 bushels, against 34,234,455 bushels in a like portion of 1889.

Groceries are slow, owing to a slack interior demand. Refined sugars are easier. In coffee there is a radical decline, occasioned by reports of a contemplated removal of the export duty in Brazil. In dry goods there was something doing for shipment by water routes, and a cheerful feeling generally in anticipation of renewed activity after the elections. Imports of foreign goods are steadily decreasing. Two large Broadway clothing houses failed, with liabilities amounting to over $400,000 and very small assets.

Exchange was dull and heavy, in consequence of the absence of demand and a little better supply of commercial bills, chiefly drawn against cotton and provisions. Rates closed 1¢ ℔ pound sterling below the opening. Referring to the recent gigantic speculation for a rise in London, the *Economist* says: "The wreckage has been extremely small in comparison with the fall in prices and the great magnitude of the speculative account that had to be closed."

Edward C. Leech, the Director of the Mint, in his annual report, shows that the value of the gold received at the mints during the fiscal year was $49,228,823; 37,438,778 standard silver ounces, of the coining value of $43,565,135, were also received. The coinage was the largest in the history of the mint, aggregating 112,698,071, pieces to the total value of $60,254,436. The total amount of silver purchased during the fiscal year for the coinage of silver dollars was 30,912,111 standard ounces, costing $26,899,326, an average of $0.9668 per fine ounce. From the close of the fiscal year to August 13, the date the new Silver act went into effect, the amount of silver purchased was 3,108,199 standard ounces, costing $3,049,426. The amount of silver bullion purchases under the act of July 14, 1890, which went into effect August 13, to October 31, has been 12,276,578 fine ounces, at a cost of $14,038,168, an average of $1.14349 per fine ounce. The highest price reached in New York was $1.21 on August 19, and in London 54⅝d, equivalent to $1.19½, on September 3. The price in New York did not vary materially from August 19 to September 3, when a decline took place, extending, with occasional slight advances, to the present price, $1.07.

The National Board of Trade will be held in New Orleans, December 8, where it is probable the by-laws will be so changed that membership of individual firms throughout the country may be permitted. A State Board of Trade was formed in Boston, 30th ult.

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, November 5, 1890.

Prices for Pig Iron warrants have averaged higher, Scotch sold up to 52/10; Cleveland to 49/ and Hematite to 59/6. Outside speculation has shown greater spirit under the influence of growing scarcity of makers' Iron, exhaustion of stocks in warrant stores and continued free shipments. A steamer has been chartered to bring 5000 tons of Spanish Pig Iron from Bilboa to the Clyde, and regular shipments from that quarter are expected during the strike. There are no prospects at present of an early settlement of the latter.

The markets for Copper and Tin have been more or less unfavorably affected by the condition of the money market, the fluctuation in silver, and fears of an advance in the Bank of England rate of discount. Depression in speculative markets generally has had an unfavorable bearing also. Tin for prompt delivery has been as low as £96. 12/6, and Merchant Copper Bars to £57. 10/. There has been very little speculative buying until the last two days, and consumers have purchased in a very moderate way. Values have received little or no support, except that which may be given by persons directly interested as holders. Copper furnace material is still difficult to sell. Smelters are buying only as immediate wants require, owing to difficulties with workmen. About 140 tons Anaconda Matte have been sold at 11/6 from old stock. The visible supply of Copper in Europe was reduced 1681 tons, and heavy deliveries continue. To-day the market for Bars is stronger and more active.

The market for Tin Plate has been firm, but quiet, buyers being still inactive, while makers hold for full prices. There are, however, negotiations pending on large quantities for delivery during the early part of next year, including some interest on the part of American buyers.

Bolckow, Vaughan & Co. have started another furnace.

Scotch Pig Iron.—There has been more doing, and sales from second hands are noted at advanced prices.

No. 1 Coltness,	f.o.b.	Glasgow	..
No. 1 Summerlee,	"	"	..
No. 1 Gartsherrie,	"	"	..
No. 1 Langloan,	"	"	..
No. 1 Carnbroe,	"	"	57/
No. 1 Shotts,	"	at Leith	..
No. 1 Glengarnock,	"	Ardrossan	..
No. 1 Dalmellington,	"	"	59/6
No. 1 Eglinton,	"	"	..

Steamer freights, Glasgow to New York, 2/, nominal; Liverpool to New York, 10/.

Cleveland Pig.—Demand is only fair, but the market firmer, with 48/6 @ 49/ quoted for No. 3 Middlesborough, f.o.b.

Bessemer Pig.—Prices are held higher, but the demand is rather slow. Makers quote West Coast brands, Nos. 1, 2 and 3, at 60/, f.o.b. shipping port.

Spiegeleisen.—A fairly active demand is noted, and prices are rather higher. English 20 % quoted at 102/6, f.o.b. shipping port.

Steel Rails.—The demand has continued good, but makers have not realized the advance asked last week. Heavy sections quoted at £5. 2/6 and light sections £6, f.o.b. at N. W. England shipping point.

Steel Blooms.—Prices are somewhat irregular, but there is a very fair business passing. Makers quote at £4. 17/6 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—The demand continues good and prices remain firm. Bessemer, 2¼ x 2¼ inches, £5. 2/6, f.o.b. at N. W. England shipping point.

Steel Slabs.—A fair trade passing, but prices rather irregular. Bessemer quoted at £5, f.o.b. at N. W. England shipping point.

Old Iron Rails.—The market unsettled. Buyers and sellers far apart. Tees quoted at £3. 2/6 @ £3. 5/ and Double Heads £3. 5/ @ £3. 10/, f.o.b.

Scrap Iron.—No change in prices and the demand moderate. Heavy Wrought quoted at £2. 6/ @ £2. 7/6, f.o.b.

Crop Ends.—A quiet market for these, with prices unchanged. Bessemer quoted at £3 @ £3. 2/6, f.o.b.

Tin Plate.—Makers firm, but the demand still rather slow. We quote f.o.b. Liverpool:

IC Charcoal, Alloway grade	18/6 @ 19/
IC Bessemer Steel, Coke finish	17/9 @ 18/
IC Siemens " " "	18/ @ 18/3
IC Coke, B. V. grade	17/6 @ 17/9
Charcoal Terne, Dean grade	16/9 @ 17/

Manufactured Iron.—A fair amount of business passing and prices generally steady. We quote, f.o.b. Liverpool:

	£	s.	d.		£	s.	d.
Staff. Marked Bars				@	9	0	0
" Common "	7	0	0	@	7	5	0
Staff. Bl'k Sheet, singles	8	0	0	@	8	2	6
Welsh Bars (f.o.b. Wales)	6	7	6	@	6	10	0

Tin.—The market closes firmer, but rather quiet. Straits quoted at £97 @ £97. 5/, spot, and £96 @ £96. 5/ for three months' futures.

Copper.—Business more active and the market stronger to-day. Merchant Bars sold at £57. 15/ @ £58, spot, and £57. 10/ @ £58 three months' futures. Best Selected, £65.

Lead.—Demand slow and prices a shade easier. Quoted at £14. 5/ for Soft Spanish.

Spelter.—No further change in prices. Demand very fair. Quoted at £25. 2/6 for Ordinary Silesian.

Trial of the Newark.

On Tuesday of last week the cruiser Newark left the wharf of William Cramp & Sons on a "builders'" trial trip. This ship is one of the protected deck class of cruisers. She is built of steel throughout, is 328 feet long over all and 310 feet on load water line. Her beam is about 49 feet and her depth is about 32 feet, and, when in commission, will draw about 19 feet mean. Her motive power is two triple expansion engines of 6000 horse-power, natural draft, but capable of making 8500 under forced draft, which she exceeded in the trial just made. The cylinders of each set of engines are 34, 48 and 76 inches in diameter, with a stroke of 40 inches. Steam is furnished by four steel boilers, 13½ feet in diameter by 19½ feet long, and made to stand a pressure of 160 pounds per square inch. The grate surface is 540 feet. The coal supply is 400 tons, but the ship's bunkers have a capacity of 850 tons. In addition to the engines the cruiser will be bark-rigged, and have a sail area of 12,000 square feet. Everything that can be done by steam will be done on board. Hoisting engines abound, as do also pumps of every kind. A protection deck of steel covers the engines, boilers, steering gear and rudder head, and the engines and boilers are still further protected by a pit of coal.

The main battery consists of 12 6-inch breech loading rifles, mounted in sponsons on central pivot carriages, with circular 2-inch steel shields fitted to each carriage to protect the gun's crew, as well as the mechanism of the gun and carriages, from machine gun fire. The forward two guns, one on either side, are placed under the forecastle deck, and train from 70° abaft the beam to 95°, forward, thus having a cross fire of 5°, converging at 111 feet forward of the stem. The after two guns are placed under the poop, and can be trained from 70° forward of the beam to 93° abaft, thus having a cross fire of 3°, converging at 243 feet abaft the stern. The second pair from forward, together with the second pair from the stern, are placed under the bridge.

On the trial the ship developed 9000 horse-power and a speed of 19¼ knots. Should this power be developed on the official trial soon to take place, the builders will be entitled to a bonus of $50,000. It was calculated that with 8500 horse-power a speed of 18 knots would be attained.

The Eaton, Cole & Burnham Company, 82 and 84 Fulton street, New York, have just completed at their factory at Bridgeport, Conn., for Jenkins Bros., New York, two of the largest back pressure valves ever manufactured. They are nominally 24-inch valves of the style technically known as Globe valves. The valve clapper or disc with its spindle and other moving parts, weighs about 800 pounds, and to provide against the great blow and consequent shock of this clapper striking its seat impelled by an additional force of about 1500 pounds, a dash pot was bolted on in addition to the usual cover or top. Attached to the spindle and working in this dash pot is a piston provided with four valves and longitudinal ports, by the operation of which the blow of the valve is cushioned, at the same time allowing it to open and close rapidly, but entirely dispensing with the incessent clatter and pounding of ordinary back pressure valves. The completed valves stand about 5 feet high and weigh finished 4500 pounds each. The company have also finished to be used in connection with the above valves four gate and two angle valves. The aggregate weight of the eight valves is about 17½ tons.

The Central Expanded Metal Company, of Pittsburgh, are meeting with a large demand for their expanded metal lathing and fencing, the demand for the lath being particularly heavy. At present they have enough orders on hand to keep them fully employed for some time to come. They have just received a large order from the Government for the lathing to be used in the construction of the building to be used as Headquarters of the United States Military Academy at West Point, N. Y. In this connection we desire to refer to the new use being made of expanded metal lath for outside finish, which is coming into favor in different localities. The method pursued is that of covering a studded wall on the outside with expanded metal lath instead of weather boarding. The lath is then covered with Portland cement in imitation of stone. It is stated that a house built in this way will cost but little more than a good weather boarded one, and one-third less than a stone wall, while the advantages are much in favor of this construction in point of comfort, the claim being that the house will be warmer in winter and cooler in summer and free from dampness, very important qualities for a residence.

The McDoughal Shipyard Company, of West Superior, Wis., have at present on their docks seven iron vessels in course of construction, four of them barges and three steamers, the carrying capacity of each being from 2200 to 2500 tons. Two of these vessels are destined for Atlantic trade and can be built at a price that renders their Atlantic delivery profitable.

Renovo Fire Brick and Clay Company, Limited, office 420 Walnut street, Philadelphia, inform us that a very valuable deposit of pure fire clay has been developed on their property at Renovo, Pa. This strata of clay underlies 2700 acres of land and averages 8 feet in thickness. The company started with a capacity of 5000 bricks per day, but this output soon proved inadequate to the demand. They now have a capacity of 20,000 a day, and are about making arrangements to increase to 40,000.

The Troy Steel and Iron Company, at Troy, N. Y., have lately adopted the direct Bessemer process, successfully carrying the molten iron in ladles on a steamer from the furnaces on the island to the steel plant. Two of the blast furnaces are now being relined, the principal change being an increase in the size of the bosh.

Inexhaustible mines of onyx, claimed to be superior to that of Mexico, have been discovered in caves in the Ozark Mountains, within 70 miles of St. Louis, and a syndicate has been formed to market the product. The onyx is found in stalagmites and solid ledges many feet thick.

The strike of the journeymen freestone cutters in Boston, which has been in progress since February 28, has been declared off. The cause of the defeat is alleged to be the disunited action of the building trades' council and the refusal of the carpenters and bricklayers to strike after pledging their support. During the trouble $11,000 has been expended to maintain the struggle, and but seven of the 275 members of the union returned to their old employers.

HARDWARE.

Condition of Trade.

WITH THE advancing season there is naturally a falling off in the volume of business, but manufacturers are in many lines well supplied with orders and jobbers throughout the country are busy. It will be obsrved that the reports given below indicate almost uniformly an unusually satisfactory condition of things, while the outlook for future business is excellent. There have been during the past week very few announcements of changes in price, but in one or two staple lines the market is not as strong as it has been, while other lines are steady and in some cases decidedly firm. There is some complaint in certain sections in regard to collections, but on the whole these may be characterized as fairly good.

Chicago.

(By Telegraph.)

Shelf jobbers are fully as busy as they were last month, and packing is still proceeding at night in some houses to keep up with orders. Trade continues to run largely into the regular Hardware line, while Nails, Barb Wire, &c., are somewhat neglected. The heavy Herdware jobbers say they never before had such a month as October, and that November has started out very well and bids fair to make a good record also. Prices are unchanged and collections are excellent.

St. Louis.

(By Telegraph.)

The month of October has been entirely satisfactory to jobbers of Hardware, both as regards business and prices. Traveling salesmen are sending in good sized orders, and the local demand is of such a character as to keep jobbers well employed. The Tariff bill has unsettled some lines, particularly Cutlery, Guns, &c., but it is expected that matters will shortly adjust themselves, especially when dealers become cognizant of the fact that the changes are not so radical as they anticipated. Wire Nails are moving quite freely on the basis of $2.35 on cars here. Barb Wire continues in active demand at 2.8¢ for Painted and 3.4¢ for Galvanized. The building trades are unusually busy, and a large trade in builders' supplies is reported by all jobbers.

San Francisco.

HUNTINGTON HOPKINS COMPANY.—The hardware situation in this market is, generally speaking, good. The movement in shelf goods and building material and also the heavier lines is quite satisfactory, considering the state of affairs just now, being as we are on the eve of a State election, which, as everybody is aware, monopolizes more or less time and attention. Building trade in the city is good. We have several large and expensive buildings in course of construction. We have also a large number of dwelling houses of all classes in the course of construction. Collections generally are good, more particularly in those sections of the State where fruit and grain are the principal industries; in other sections they are not as good, but summing the whole matter up, both trade and collections are in a healthy and satisfactory condition.

Cleveland.

THE W. BINGHAM COMPANY.—There were 29 rainy days in October, and, in consequence, the roads in this part of the country (never much to brag of) are simply horrible. Notwithstanding this, trade has been rushing and orders well assorted. Season goods are selling particularly well, with comparatively little cutting. Staples are in good demand; Nails, Cut, $1.80; Wire, $2.35, rate from stock, with usual discount for shipment from mill. Wire orders fair; Barbed, Painted, $2.95; Galvanized, $3.45. Inquiries for spring delivery on Wire are coming in, particularly from the grape sections, but the mills are disinclined to quote for delivery later than December 31. The Iron market is in rather an odd position at present, with Pig Iron weak and lower, and Manufactured Iron stiff and advancing, no falling off of orders. There must soon be a leveling of prices. Either Pig will advance or the manufactured article will have to weaken. Retail trade throughout the city is good. Dealers who make a specialty of Builders' Hardware are particularly busy. If the work that is now in the hands of the architects is carried out, the building boom for 1891 will exceed that of this year. Money market still tight. Collections fair, but we may look for worse unless the roads soon freeze up.

Portland, Ore.

FOSTER & ROBERTSON.—On Saturday evening, October 25, the second annual exposition of the North Pacific Industrial Association, after a 30-day session, closed "amid a blaze of glory." Many prominent persons from the East, in attendance upon the exposition, have stated that nothing equal to it has been seen since the Centennial Exposition of 1876. Trade continues very active, both mail and travelers' orders are numerous, of fair size and well assorted, while the house trade has been much larger than usual, owing to the presence in the city of many country merchants in attendance upon the exposition. There have been no material changes in prices within the last two weeks. Tin Plate, Wostenholm Cutlery and other goods affected by the new Tariff law are moving off freely at the advanced prices mentioned in our last letter. Collections are good, but are affected somewhat west of the mountains by the slight decline in the price of grain, and east of the mountains by the inability of the Union Pacific Railroad Company to furnish the cars as fast as the grain is offered.

Omaha.

LEE-CLARKE-ANDREESEN HARDWARE COMPANY.—As the autumn season approaches the winter months, activity in commercial circles continues unabated, and the outlook is alike satisfactory to the merchant and banker, though, perhaps, the latter would prefer more stringency in the money market, as loanable funds are reasonably plentiful and rates comparatively easy. The farming community are no exception to the present general rule, and croakers just now are difficult to find. So far as can be learned the country looks forward to a continuance of at least the present meed of prosperity. Owing to the action of trusts, combines and (class) legislation, jobbers have been forced to advance prices on many lines of goods. The promised beneficial result of the recent Congressional tariff legislation is looked forward to with grave suspicions. Nothing remains now but to wait and see.

Louisville.

W. B. BELKNAP & CO.—The usual large volume of trade continues, though the cotton growers are still complaining of excessive wet and cold weather. Had it not been for the tight money market, of which we have felt the full effect in Louisville, there would have been unquestionably decided advances in Iron and Steel of all kinds, but this has exercised a restraining influence hardly to be overestimated. New enterprises have received quietus for the time being, promoters and their friends have about enough to pay up subscriptions to old ones. Still there have been wonderfully few failures, and those in legitimate business have experienced no trouble in getting funds for their needs. The banks are making good showing by reason of the rates obtainable for loans. Scarcely anything is taken for less than 7 per cent., and 8 per cent. is obtainable for loans not gilt edged or small amounts. Prices are as steady as we have ever known them, and where concession is made, as it sometimes is, it is with a view of securing future business rather than for anything immediate, as it is difficult to secure prompt shipment of assorted lots of Bar, Steel Sheet, Bolts or any of the great staples. The consumption is unquestionably healthy and enormous.

Baltimore.

CARLIN & FULTON.—The month of October just closed has shown to the trade an aggregate business probably equal to that of previous years, stimulated perhaps by the anxiety of buyers to purchase foreign goods prior to the enactment of the Tariff bill. The rush of the fall trade may be now considered over, and there will be very little business done during the balance

of the year, except with our near trade in the lines of Meat Cutters, Stuffers, Coal Hods, Axes, Sleigh Bells, Skates and such goods as cold weather may suggest to the buyer.

The November elections will interfere very much with business in the early part of the month, especially in the rural sections, where the voters turn out *en masse* to hear the eloquence of their favorite orators and candidates; and then generally in the village store discuss with each other the question of the day. As the purchases made during the summer by the Southern trade are now maturing, the payments of these accounts will greatly help the money market in the large cities, and from now on to the end of the year we look with expectant eyes to the remittances which should be frequent in every mail. Prices remain for the most part very steady, though possibly, with the reduced demand for goods, some of the staples may weaken before the end of the year.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—It is our pleasure to report regarding the trade for the past two weeks that the volume has been fully up to the standard for this season of the year. Merchandise moved has been satisfactory to all hands, so far as reports can be made. Changes in prices of staple Hardware have been very few. The market on Wire Nails has suffered somewhat of recent date. Some manufacturers being anxious for orders for immediate shipment, and for specifications in hand, they have been willing to make slight concessions below the price named during the last few months, and a concession of 5 cents per keg, at present prices, is considerable. With the adoption of the new Cutlery list, as framed by importers, the retail trade recognize more fully the fact that the new prices are rock bottom, consequently in most cases are buying more freely, and sales have been fully up to and above expectations. The survey of the commercial outlook has no discouraging color, but, on the contrary, presents one of bright appearance. Prospects for a continued good trade during the winter look bright. Stocks are not accumulating either in the hands of the jobber or the retailer. The production of Manufactured Iron is almost phenomenal. Mills are being run to their fullest capacity, and the consumption keeps up to the fullest limit, and from present appearances the output will no more than equal the demand for some time to come. Collections, while fair, are no greater than the demands for increased business require. Railroads are taxed to their fullest capacity in the freight department, and nothing discouraging at present is seen on the horizon.

Boston.

BIGELOW & DOWSE.—October business has been fully up to the average of past years. Retail dealers report good sales for Builders' Hardware, and there is a general feeling of contentment. Notwithstanding the extreme low prices now ruling on many different lines of Hardware, there is not much disposition shown by dealers to anticipate their wants very far ahead. The outlook is for a good, fair fall trade, but we do not anticipate any material improvement in prices for the present.

Prices.

Cut Nails.—The Cut Nail market is feeling to a certain extent the effect of the lower prices for Wire Nails which are now current, and it is probable that if Wire Nails should go lower a decline in Cut Nails is not unlikely. There was some disposition at the last meeting of the Eastern Association to put Iron Nails at $1.70 at mill, but this was not thought advisable and efforts to maintain the price at $1.80 have thus far been successful, the following quotations representing the market: Iron Nails, $1.80 at mill, $1.90 at dock, $2 from store, with 10¢ additional for Steel.

Chicago, by Telegraph.—The market has been further demoralized this week by the distribution of a circular from the Junction Iron Company, of Wheeling, naming $1.70 at mill, usual terms, for any specification, $1.65 for 30-cent average and $1.60 for 35-cent average. Jobbers quote $1.90 for small lots and $1.85 carloads.

Wire Nails.—The market is weak and prices are somewhat lower than at our last review. The mills are for the most part up with their orders, and some of them are evidently desirous to effect sales at considerable concessions from prices recently ruling. The market is thus in the buyer's favor. The price for carload lots at mill may be named as $2.25, but it is understood that concessions are made from this figure. There are no indications of an immediate improvement.

Chicago, By Telegraph.—There is an unusual variation at present in factory prices, quotations delivered at Chicago ranging all the way from $2.32½ to $2.45. The manufacturers are themselves unable to see anything reassuring in the future. In proportion to the cost of rods the price of Wire Nails is now lower than ever before known, and there is little chance of an improvement until either steel billets advance or the output of Nails is restricted. Jobbers quote $2.50 for small lots and $2.40 for carloads.

Barb Wire.—The demand for Barb Wire, as usual at this season, is rather moderate, and the tone of the market is somewhat weak. Quotations are on the basis of 3.15 to 3.20 cents for Galvanized Four Point at mill.

Chicago, by Telegraph.—Jobbers report business very light, and continue to quote from stock Painted at 2.9 cents, and Galvanized at 3.5 cents. The carload business is small, but is being served by manufacturers at about 2.7cents for Painted and 3.25 cents for Galvanized.

Shot.—There has been no further change in the prices of Shot made by the associated manufacturers, but in their advertisement on page 85 Globe Shot Works, Philadelphia, who are not members of the combination, offer Shot at $1.60 per bag, less 5 cents a bag for cash on receipt of bill.

Tackle Blocks.—Very low and irregular prices still rule, and there are few signs of improvemont. It is understood that a conference between some of the manufacturers will take place during the presen month.

Wire.—There is little change in the prices of Market Wire, but slight concessions have recently been made on ruling prices which have been remarkably steady for some time.

Steel Goods.—A meeting of the Steel Goods manufacturers was held at the Russell House, Detroit, Mich., on the 28th ult., at which there was a full representation. Statements were made by the different manufacturers as to the magnitude of their sales up to date, from which it became apparent that by far the larger part of the annual output had already been placed. Sales were found to be thus very much in excess of usual seasons at this time, and some of the factories reported their entire product sold. It was also generally agreed that stocks in the hands of both dealers and manufacturers at the commencement of the season were light, and this, together with the fact that a large number of dealers have not yet placed their orders, led the meeting to conclude that the unsold product in the hands of the manufacturers will fall considerably short of meeting the requirements of the trade, and it was accordingly the opinion of those present that existing prices should not only be firmly maintained, but that all quotations hereafter made should expire December 1. The market is thus, it will be seen, in a very satisfactory condition, and it is thought not unlikely that an advance will be made early next month.

Elliptic Springs, &c.—The following revised prices are announced, under date October 16, by Tuthill Spring Company, Hammond, Ind.; terms four months, or 3 per cent. discount for cash in 30 days, with the usual deliveries:

Elliptic Springs, Platforms, &c.—60, 10 and 10 per cent. discount from standard list. (If purchases of the above before September 1, 1891, amount to $1000 or over, a rebate will be given of 5 per cent; if $2000 or over, the rebate will be made 10 per cent.)

Timken Springs, per set, royalty paid, as follows, net:

	No. 0.	No. 1.	No. 2 and 2½.	No. 2¾	No. 3.	No. 4.
Bright, brass bushed	$3.00	$3.10	$3.40	$3.60	$4.20	$4.80
One-half bright, not bushed	2.60	2.70	3.00	3.20	3.75	4.35

Sidebar Springs, in sets of four, net.
Bright, brass bushed, 1¼ inch, $2.30; 1½ inch.....$4
One-half bright, not bushed, 1¼ inch, $2; 1½ inch.....$3.70
Tuthill Coil Springs, crucible steel, brass bushed, net.
Buggy or Road Wagons, $2; Surrey.....$4
No quantity rebate on patent Springs.

Saws.—The trade will be interested in the announcement on page 82 of C. E. Jennings & Co., 79 and 81 Reade street, New York, relating as it does to the line of Saws which they are now putting on the market. Having purchased the plant of the Port Jervis Saw Works, they advise us they are in a position to execute orders on a full line of Hand, Panel and other small Saws, and have also in stock a

full line of Buck Saws. Their new Saw catalogue is in preparation and will be ready for delivery December 1. Other information in regard to their brands and the goods they are offering is given in the advertisement. Their quotation on Hand, Panel and Rip Saws is 25 per cent. discount.

Rules.—The Rule market continues without evident improvement, quotations being still exceedingly low. Touching upon this matter, we have received the following communication from an exceptionally well informed party, in which reference is made to some of the causes of the demoralized condition and conservative action on the part of manufacturers suggested:

Referring to the very low price of Boxwood Rules that has prevailed for several years, as stated in *The Iron Age* two or three weeks ago, the question naturally arises—bearing in mind the fact of their being but four makers—as to the cause of this state of things. The great increase of machinery and the failure of efforts to maintain any sort of an understanding as to prices have no doubt tended to make them low.

The four old makers have well equipped factories and large experience, and it may be doubted if any one of them has any particular advantage over the other. Some may get their motive power at less cost, which, with low rents, may be offset by larger capital and other branches of business, and even when the business is made a specialty it may be questioned whether under ample experience and skill it cannot successfully sustain itself in competition with the more diversified industry.

One principal cause of the downward tendency of these goods to a point which yields no profit has been a too ready disposition to cut a very narrow margin at the beck of some syndicate or other buyer, as if the product had no market value of its own and must be forced in order to sell. A reasonably conservative attitude on the part of producers and a just valuation of the capital, skill and experience required to make the business a success, or the goods worth selling, should give the makers backbone enough to demand rightful compensation.

Miscellaneous.—*Charlton's Detachable Meat Hook.*—This article, which is described among the novelties on page 824, and manufactured by Wm. J. Lloyd Mfg. Company, Philadelphia, is sold from the following list, which is subject to a discount of 40 per cent.:

No.	1	2	3	4
Per gross	$8.50	$10	$12	$15

Chucks.—The following are the discounts made by the Westcott Chuck Company, Oneida, N. Y., on this line of goods:

	Discount.
Little Giant Drill Chucks, improved	40 %
" " Double Grip	40 %
Oneida Drill Chucks	40 %
Scroll Combination Lathe Chucks	40 %
Geared " "	50 %
Plain Universal "	50 %
Independent "	50 %
Cutting Off Chucks	40 %

In this connection the description of this Little Giant Double Grip Chuck, page 95, will be of interest.

Carriage Robes, &c.—Jesse Lee & Sons, 37 South Fourth street, Philadelphia, issue a price-list of Winter Horse Clothing and Carriage Robes, which covers a large line of staple and special goods, with list prices. The prices given are subject to a discount to the trade of 50 per cent., 60 days net, or 2 per cent. additional discount for cash in 10 days.

Washing Machines.—In many parts of the country Washing Machines are, to an increasing extent, handled by Hardwaremen, and are to be found in the stocks of leading Hardware houses in such centers as St. Louis, Chicago, Milwaukee, Minneapolis, &c. The following are the prices of the Anthony Wayne Washer, manufactured by the Anthony Wayne Mfg. Company, Fort Wayne, Ind.:

No. 1, $4.50 each, or $51 by the dozen.
No. 2, $4 each, or $45 by the dozen.
No. 3, $3.75 each, or $42 by the dozen.

Old Metals, &c.—For the convenience of the trade we give in our quotation columns prices paid in New York for Old Metals, &c. They are as follows:

Heavy Copper	℔ 12¢
Light Copper	℔ 11¢
Heavy Brass	℔ 10¢
Light Brass	℔ 8¢
Lead	℔ 4¢
Tea Lead	℔ 3½¢
Zinc	℔ 3¢
No. 1 Pewter	℔ 16¢
No. 2 Pewter	℔ 8¢
Wrought Scrap Iron	℔ gross ton, $19.00
Heavy Cast Scrap	℔ gross ton, 12.00
Stove Plate Scrap	℔ gross ton, 8.00
Burnt Iron	℔ gross ton. 6.00

The market is referred to as quiet; comparatively little doing at present.

Cordage.

THE BUSINESS of manufacturing Cordage is very largely in the hands of the National Cordage Company, New York, which is a consolidation of the interests of the following manufacturers:

L. Waterbury & Co., Brooklyn, N. Y.
William Wall's Sons, Brooklyn, N. Y.
Elizabethport Cordage Co., Elizabethport, N. J.
The Tucker & Carter Cordage Co., Brooklyn, N. Y.
Geo. C. Pooley & Sons, Buffalo, N. Y.
Xenia Twine and Cordage Co., Xenia, Ohio.
J. Rinek's Sons, Easton, Pa.
Akron Twine and Cordage Co., Akron, Ohio.

In addition the company controls the manufacturing properties of the following companies:

Victoria Cordage Co., Dayton, Ky
H. R. Lewis & Co., Philadelphia, Pa.
Baumgardner, Woodward & Co., Philadelphia, Pa.
New York Cordage Co., New York.
Atlas Cordage Co., New Orleans, La.
Randall, Goodale & Co., Boston, Mass.

With the exception of the four manufacturing properties last mentioned, the former managers or proprietors of the several concerns are under contracts with the company for long terms to run the respective mills under a system of competitive bids, the raw material being furnished by the company, and awards being made to the lowest bidders. The contractors, whether successful or unsuccessful in bidding, are under obligation by the same contracts to maintain the mills at their own expense in a fit state of efficiency for the next annual competitive bid, in which they are obliged to take part. The fact that the company buys a large percentege of the fiber used in this country for Cordage and Binder Twine gives it advantages in the market, as its contracts cover very large quantities.

The principal manufacturers independent of the National Cordage Company, but understood to be acting in harmony with them in the matter of prices, are the following:

Plymouth Cordage Company, Plymouth, Mass.
Boston Cordage Company, Boston, Mass.
Standard Cordage Company, Boston, Mass.
Lawrence Cordage Company, New York.
E. H. Fitler & Co., Philadelphia, Pa.
Schlichter Jute and Cordage Company, Philadelphia, Pa.
Jackson & Sons, Easton, Pa.
John Good, New York.

Targets and Traps.

THE TARGET TRAP business is apparently in a very unsatisfactory condition, the manufacturers claiming that goods are being sold without profit. The trouble arises largely from the new manufacturing companies that are started selling their production at unprofitable prices for the first year, with the expectation of getting the money back the following year. It is stated that within the last five years there have at least a dozen companies entered the field, and after spending their capital have given the business up. Inferior goods have been put upon the market and by extensive advertising have found a market. The more reliable goods have to a certain extent been sold at a price to meet that of the poorer articles. For these and other reasons the Target Trap business has been carried on without satisfactory returns. In this connection it is interesting to note the shrinkage in values of sporting goods, and particularly of Targets, in which the decline since 1885 has been from $25 per 1000 to about $7.50 per 1000, the former prices being before the advent of composition targets. During the past year or two there have been a number of suits for infringements of patents pending. These suits have been brought by the Peoria Target Company, of Peoria, Ill., and are on certain improvements on Traps for throwing targets. A decision, we understand, has lately been given in suit of the Peoria Target Company *vs* another company and an injunction obtained. This is said to be a test case. A preliminary injunction has also been issued against another manufacturer.

Trade Items.

THE executors of the late Thomas T. Miller, Easton, Pa., have sold to four heirs the entire stock of Hardware belonging to the estate, and the purchasers have formed a limited partnership under the laws of the State of Pennsylvania, with the name of the Thomas T. Miller Company, Limited. The new management will continue the wholesale Hardware business as heretofore, with Rufus W. Miller as president and Frank C. Miller secretary and treasurer of the company.

JAMES P. DALTON, one of Chicago's best known retail Hardware merchants, has removed to 56 and 58 Wabash avenue, where he has secured a very commodious store room, which has been handsomely fitted up for his use. The building in which he was formerly located, on State street, is being torn down to make room for the new Masonic Temple. One of his show windows contains a very artistic heating stove, manufactured by Rathbone, Sard & Co., whose offices and sample rooms are in the second story of the same building.

THE TRADE will observe among the Special Notices on page 64 one in which F. B. Burcaw & Co., Hazleton, Pa., call attention to their Weather Strips, which are described as dust and storm proof. Their circular relating to these goods illustrates their special features.

DODDS' LIQUID GLUE is the name of a new Fish Glue recently placed upon the market by the D. Webster King Glue Co., 166 and 168 High street, Boston, who are the agents for this country and Canada. The Glue is manufactured by A. W. Dodd & Co. at Gloucester, Mass., under the most

improved process, and is offered in very attractive packages. Frank H. Abbott, formerly with the Le Page Co., is general superintendent for Messrs. Dodd & Co., and their factory has been supplied with all the latest improved machinery.

AMERICAN SKATE COMPANY, for whom Thomas A. Lamotte, 11 North Fourth street, Philadelphia, is agent, illustrate in their advertisement on page 91 one of their leading patterns of Reindeer Skates, which shows the special feature to which they call particular attention, that from the manner in which the Skate is ground it does not rest 1 inch on solid ice. Their catalogue, which is a very creditable one and attractively printed, shows the different patterns they are putting on the market, and explains that from the manner in which the Skates are ground little friction is created, so that one can Skate with less fatigue on the Reindeer than on other Skates.

E. C. STEARNS & Co., Syracuse, N. Y., under date November 1, announce that they have discontinued their Chicago agency and removed the stock formerly carried there by H. H. & C. L. Munger. All shipments will hereafter be made from the factory.

THE MICHIGAN CAN MFG. COMPANY, Grand Rapids, Mich., are introducing their Satisfaction Oil Can. These are made of galvanized iron and metallic fittings, the nozzle or outlet being detachable. The construction of the can is such that by raising the operating rod the oil is forced into a syphon tube, and while the rod is held in a raised position, it is stated that the oil flows in a continuous stream from the nozzel. To shut off the flow the operator is directed to push the rod down quickly. The following advantageous points are referred to among others in the manufacturers' circular: That there are no valves or packing; no stop cock, spigot or screw plug to get out of order; that the flow of oil is continuous without constant motion on the part of the operator, and that there is no dripping from the nozzle when the flow is shut off.

THE MANUFACTURER of the Best Yet Can Opener, illustrated on page 100, reports that he has met with excellent success, and that shipments of this Can Opener have already been made to Australia, New Zealand, South America, West Indies and Mexico.

THE PECK, STOW & WILCOX COMPANY, New York and Southington, Conn., are manufacturing an Improved Bench Plate, with polished surface, known as No. 3, designed for tinners and metal workers. It consists of a square frame, 9 x 9 inches, in which is a circular plate which may be revolved. This plate has a number of openings for receiving Tools, Stakes, Shears, &c. The Bench Plate is set into the bench flush with the surface. Some of the advantages possessed by this plate are that tools can be turned in any position without being removed, that it economizes space, that it holds bench shears at two different angles and that it does away with a large iron plate with a number of holes, or having holes cut in the edge of the bench.

WE ARE ADVISED by Foster & Robertson, Portland, Ore., that during the past month they have been favored with visits from a number of Eastern Hardwaremen, who are out there on a trip, either for health or pleasure. Among others were Claude Hillier, of the firm of Gates & Hillier, of Cooperstown, Pa., and A. O. Bostwick and Wm. Standart, of the firm of Bostwick, Braun & Co., of Toledo, Ohio. Mr. Bostwick was accompanied by M. Nearing, president of the First National Bank of Toledo, Ohio.

ALFRED HARLEY, 212 Livingston avenue, Albany, N. Y., is the inventor of a life saving apparatus to enable people who may be cut off from other escape in a burning building to leap from the windows and escape injury. The Fire Escape consists of a large cushion or mattress supported upon a system of springs of long accumulated range or movement by which the inertia of the falling body is gradually and without shock overcome. This cushion or mattress is mounted upon suitable running gear, and is of so light construction as to enable it to arrive at a fire in advance of other heavier apparatus.

GIES & Co., Buffalo, N. Y., lithographers, have just completed for the Michigan Stove Company a lithograph of their works and branch houses. The space covered with colors is 28 x 44 inches, and is referred to as being larger than anything of the kind done before. The entire upper half of the sheet is taken up with a bird's-eye view of the Michigan Stove Company's works and surroundings. The center of the lower half of the lithograph shows the front elevation of their Buffalo house. On the right of this a perspective view of their Western headquarters at Chicago is given, and to the left of the center a perspective view of the New York house. At each side of the center of the sheet is the trade-mark of the company. The coloring and design are both meritorious, and Gies & Co. are to be congratulated upon the successful execution of so pleasing and elaborate a piece of work.

IN THEIR ADVERTISEMENT on page 58 the Bryden Horse Shoe Company, Catasauqua, Pa., illustrate their line of Horse and Mule Shoes, showing some of the different patterns they are putting on the market. It will be observed that attention is called to some of the special features of these Shoes, the care with which they are made, the quality of material and the advantages of pattern. Of this company C. K. Barns, of the firm of Justice Cox, Jr., & Co., 224 South Fourth street, is president. The catalogue of the company, which is neatly printed and well arranged, conveniently represents this important line of goods.

PARKHURST & WILKINSON, Chicago, Ill., have issued a circular in regard to the effect of the revised tariff upon the goods they sell. They touch upon the following lines: Woolen Cloths, Plushes and Carpets, Corduroys, Iron, Iron Beams and Structural Shapes, Steel, Anvils and Chain. After giving information in regard to the changes in price, nearly all of which are toward higher prices, on account of increased duties, they say:

The above are the only items of any importance in our stock that are affected by the new tariff, and we take this occasion to send this information, thinking it will be easier than to write letters of explanation in each case.

The position taken by some of our public men recently, that merchants should not advance prices on goods in stock, will not be indorsed by any good business man. Merchants must realize the advances on stock on hand when there is a change in the market to offset the losses that are sure to come on a declining market. If duties should be reduced by a change in parties, as is liable to occur, no merchant could avoid a loss on what stock he happened to have on hand.

THE PECK, STOW & WILCOX COMPANY, New York, have prepared for their customers a very effective card, displaying their Little Giant Meat Cutter. This is of heavy cardboard with beveled edges, about 7 x 16 inches, with a cord attached for suspending. The Cutter is represented in operation attached by the clamp to a table with meat in the process of cutting. The card has a black background, the cutter and table are in relief, while the lettering is depressed. The meat is printed in red, and the cutter, table, letters and beveled edge are in silver. The design is unique, and the card cannot fail to attract attention wherever displayed.

THE TRADE will be interested in the advertisement, page 66, in which Bryan Plow Company, Bryan, Ohio, illustrate their Drader's Spade Harrow. A description of this article, it will be remembered, was given in these columns a few weeks ago.

SCHAW, INGRAM, BATCHER & Co., Sacramento, Cal., received premiums, medals and diplomas on their display at the exposition recently held in that city. The following were the successful arrangements: Modern Building Hardware, general Hardware, Iron and Steel (Pacific Coast manufacture), Mechanical Tools, Horse Shoes, Pocket Cutlery, Circular Saws, Mill Saws, Files, Anti-Friction Metals, Shot, Butcher Goods and Supplies.

WE ARE advised that Surpless, Dunn & Alder, 97 Chambers street, New York, have been appointed agents for the Kelly Axe Mfg. Company, Louisville, Ky. It is understood that they will give special attention to the export business.

WHEN.*

BY D. T. MALLETT.

When you have a decided taste for it, possess sufficient capital, and are acquainted with the details, you are fitted to engage in any business.

When you come to consider every other business superior to your own, you may conclude that your own business is superior to yourself.

When you have learnt to serve faithfully, you may be expected to command wisely.

When your acquaintance with the details of your business broadens, your success is more assured.

When you start in business, expect to succeed; the range of a cannon depends on its elevation.

When undesirable goods accumulate, the wheels of business are clogged.

When your stock is turned over often, you can afford to sell cheaper and still increase the net profit.

When you inquire into the causes of a marked success, you will invariably discover that much of it was due to their ability to select and retain efficient employees.

When you lock your store door at night leave your business inside. No balmy sleep with worry for a bedfellow.

When you would better your memory, exercise it; rust, not use, is the prime element of decay.

When you have decided upon a course in business which is satisfactory to your own mind and experience, do not allow the doubts of others to dampen your enthusiasm.

When you cultivate the faculty of associating names with faces, it will prove a decided benefit to your trade.

*Copyright, 1890, by D. T. Mallett.

When you have exerted your full abilities, and success seems doubtful, train your mind to review results calmly. Be sanguine. Worry, not work, is the bane of many lives.

When you accumulate wealth, consider it as a trust. Use it for the benefit of others. Generosity is its own steward.

When you hang a sign outside your place of business, it pays to have a good one. It is a permanent advertisement, and indicative of your business method to the public eye.

When a business is said to run itself, it is generally the result of the force of gravitation. Gravity is always downward.

When you begin to have some doubt of the superiority of your own abilities, you are on the threshold of a fresh advance. Over self-confidence is the rock which has sunk many a young mercantile mariner.

When you seek for the merchants of the future, look for them among the clerks of to-day.

When you word an advertisement claim nothing which is not strictly true, but never fail to claim all the truth.

When you would gain customers, advertise; when you would keep customers, advertise. Advertising pays if done liberally, honestly and judiciously.

When you expect an advertisement to create business, word it for business. An advertisement has no life in itself—it depends for its efficiency upon the vigor with which you endow it.

When you despond for lack of public encouragement, keep the fact to yourself—don't advertise it.

When there is an absolute loss in business it is generally the result of ignorance.

When you receive tuition from experience, don't forget to graduate.

When you furnish the capital and another the experience, don't swap.

When you find yourself inclined to be rash in buying stock, remember that "it is better to cry after the goods than over them."

When you walk to wealth use the feet of industry and the staff of frugality.

When you advertise, your main object should be to associate your name with your goods; next, to make a distinct statement, and last, though not least, to adopt a novel and effectual medium.

When you possess a quick perception, ballast it with perseverance. To conceive may be the action of a moment, but to execute the labor of years.

When you would be truly economical, avoid not expenditure, but waste.

When you are eagerly seeking the secrets of success, remember that the study of human nature is as important as the perusal of manuals.

When you wish to do business go where business is done.

When you come to regard employees as mere machines, you should, if consistent, regard yourself as a crank.

When you would determine the value of a man's character, observe how he spends his leisure moments.

When you have an employee whom you consider indispensable it is time either to give him an interest or accept his resignation.

When a desirable article is purchased low its sale is already secured.

When the credit you extend and the goods you possess are in excess of both your own credit and cash, look out for the sheriff.

When you are accumulating money in your own business it is better to use it in extending the business, rather than to invest the surplus in some other line of trade beyond your immediate control.

When a man of energy approaches a wall of obstacles, he does not scramble over nor creep under, but his concentrated action of purpose forces an opening.

When you have secured a fine location, an excellent stock and admirable fixtures, remember that the real end of business is to sell goods, not the keeping of a museum.

When you attempt to run to success be careful not to stub your toe.

When a large variety of a particular line of goods is carried, the use of a sample board is effective, to avoid undue handling of the stock and to save time in displaying them.

When a friend asks you to indorse for an amount which you could not afford to lose, let your answer depend upon your valuation of his friendship as compared with your own honor.

When you seek to obtain credit in excess of the amount of your capital, you have crossed the prudent line which divides business from speculation.

When you are obliged to make heavy purchases on credit, have it understood that in case you are unable to settle when due, your note will be accepted without indorsement.

When you possess the ability to calculate the future from the circumstances of the present, you have one of the greatest qualifications for success. Foresight is more profitable than hindsight.

When you hesitate about engaging in an advertising scheme from a fear of "being talked about," remember that business is not a social affair. However, do not lean too far toward the eccentric.

When seeking the elements of success do not ignore bodily health. The body is the servant of the brain, and both master and menial are better for healthful recreation.

When an employee is given an interest, even if it be a small one, his efforts become concentrated because your interests are allied to his own.

When you feel envious of the apparently rapid success of a competitor, remember that often the prize of wealth is dearly purchased.

(To be continued.)

Exports.

FOR ADELAIDE.

By W. H. Crossman & Bro.—2 dozen Meat Cutters, 1 gross Traps, 1 case Wringer Parts, 3 gross Hammers, 2 cases Plated Ware, 6 dozen Scoops, 6 dozen Axles, 3 Oil Stoves, 11,188 pounds Wire, 1 case Lamp Goods, 3 packages Hardware,

By H. W. Peabody & Co.—8 cases Windmills and Parts, 3 cases Forks, 7 cases Hoes, 1 case Drills, 7 dozen Agate Ware, 9 packages Hardware, 57 sets Axles, 2 cases Forks, 1 case Belting, 1 Air Rifle, 800 pounds Nails, 5 cases Stoves, &c., 1 case Plow Castings, 1 case Edge Tools, 8 cases Agate Ware, 1 case Polish, 12 Meat Choppers, 2 cases Hardware, 4 packages Stoves.

FOR SYDNEY.

ByHealy & Earl.—1 bale Rubber Packing, 1 box Rivets, 1 case Hardware.

By R. W. Forbes & Son.—30 dozen Cow Bells, 25 Corn Shellers, 28 packages Stoves, 4 dozen Hammers, 24 Churns, 12 packages Agricultural Implements, 50 pounds Oil Stone, 3 dozen Manure Forks, 23 packages Hardware.

FOR MELBOURNE.

By R. W. Forbes & Son.—70 dozen Axes, 8 packages Lampware, 22 cases Hardware, 7 packages Lampware, 11 packages Carriage Hardware, 16⅔ dozen Axes, 15 packages Hardware, 3 cases Harvesting Machinery, 4 dozen Glue, 17 packages Carriage Hardware.

By W. R. Peck.—1 case Saddlery Hardware.

By Woodhouse & Storts.—145 pounds Carriage Hardware.

PER BARK MARIE BECKER, OCTOBER 9, 1890, FOR WELLINGTON, NEW ZEALAND.

By Welsh & Lea.—4 cases Hardware, 3 cases Axes.

By Meriden Britannia Company.—3 packages Silver Plated Ware.

By W. & B. Douglas.—45 Pumps.

By R. W. Cameron & Co.—3 packages Pumps.

By McLean Bros. & Rigg.—12 dozen sets Sad Irons, 300 pounds Tacks, 24 packages Hardware, 62 boxes Horse Nails, 1 dozen Bits, 182 pounds Whetstones, 9 Stoves, 1 box Fittings, 63 dozen Locks, 1800 Axle Washers, 21 sets Axles, 3 dozen Churns, 10 dozen Hay Forks

By W. H. Crossman & Bro.—1 dozen Scales, 2 dozen Shears, 11 dozen Hammers, 1 case Cordage, 9 Tube Cleaners, 1 case Hardware, 1 case Agricultural Implements, 1 dozen Hay Knives, 17 Stoves, 33 pounds Stone, 1 dozen Wringers, 2 cases Hardware, 1 case Pump Parts, 2 dozen Traps.

By Arkell & Douglas.—2 dozen Coffee Mills, 3 dozen Sad Irons, 5 dozen Wringers, 4 dozen Hammers, 4 dozen Egg Beaters, 1 gross Lead Pencils, 12 Stoves, 3 cases Horse Nails, 12 dozen Traps, ½ dozen Mangles, 9 dozen Hammers, 15 dozen Axes, 14 dozen Drills, 1 dozen Churns, 7 dozen Hammers, 3 dozen Axes, 6 dozen Rakes, 4 dozen Wrenches, 4 Stoves, 6 dozen Saws, 36 dozen Lamp Goods.

By Henry W. Peabody & Co.—4560 pounds Nails, 30 packages Hardware, 1 case Graters, 50 cases Tools, 2 dozen Hoes, 2 cases Hardware, 18 Churns, 1 case Wireware, 1 case Agricultural Implements, 2 cases Hardware, 10 dozen Grain Scoops, 24 packages Hardware, 600 pounds Nails, 6 dozen Sash Cord, 2¼ dozen Wringers, 3 barrels Lampware, 2 dozen Hoes, 12 cases Edge Tools, 4000 pounds Nails, 8 cases Hardware, 1000 Cartridges, 6 cases Lamp Stoves, 1 case Edge Tools.

By R. W. Forbes & Son.—16 cases Horse Nails, 30 dozen Axes, 3 dozen Wringers, 144 dozen Axe Handles, 2 cases Hardware, ¼ dozen Scales, 12 dozen Spade Handles, 10 dozen Mattocks, 17 dozen Spading Forks, 48 dozen Sledge Handles, 10 Scales, 48 dozen Rake Handles, 25 cases Household Utensils, 6 packages Hardware, 1293 pounds Carriage Bolts, 10 dozen Axes, 1 case Door Bells, 2 cases Hardware.

PER SHIP PETER STUART, OCTOBER 11, 1890, FOR SYDNEY, AUSTRALIA.

By Hill & Hartridge.—6400 pounds Iron Nails.

By B. F. Avery & Sons.—41 Plows.

By R. H. Dana & Co.—35 dozen Axes, 2 cases Bolts.

By W. K. Freeman.—200 pounds Hardware, 10 dozen Axes.

By Woodhouse & Stortz.—1163 pounds Hardware, 88 pounds Lamp Goods, 520 pounds Edge Tools.

By Healy & Earl.—1 box Miter Tools, 1 case Saws, 1 box Hardware, 1 box Planes, 3 packages Band Saws, 2 boxes Pumps, 12 cases Wood Working Machinery, 2 boxes Emery Wheels.

Franklin F. Spencer.

In the death of Franklin F. Spencer the hardware trade loses one of its oldest and most honored representatives. He was vice-president of the well-known firm of Hibbard, Spencer, Bartlett & Co., of Chicago. Mr. Spencer had been at his desk in the office of that establishment on Saturday, a week prior to his death, but feeling more than usually fatigued he left for his home, and from that time he failed steadily, the weakness attendant upon his advanced age being tried by a congestive chill, which was the direct cause of his death on Saturday last. The funeral was held on Monday from the First Presbyterian Church and was very largely attended.

Franklin Fayette Spencer was born in Perryburg, N. Y., October 13, 1817, his father having been the proprietor of a general merchandise store in that place. The family removed during Mr. Spencer's boyhood to Gowanda, N. Y., where he received an academic education. After leaving school he entered the employ of his father, who had established a store at Gowanda. In 1840 Mr. Spencer went West and pre-empted a claim on the Rock River, in Illinois, before the Government surveys had been made in that region. There for several years he led the somewhat wild and adventuorous life peculiar to that place and period. Upon his father's death he returned to Gowanda and assumed control of his business. In 1843 Mr. Spencer was married to Rachel Gifford Macomber at Dartmouth, Mass. Several years later he again started for the West and stopped for a short time in Ohio. He drifted to Chicago in 1855, and had since made that city his home. Here he first engaged in business as the representative of Jewett & Root, Buffalo, N. Y. He subsequently opened a branch establishment on South Water street, but a fire necessitated the removal of the store to River street, where Mr. Spencer carried on business until 1865. In that year, in connection with Mr. Hibbard, he bought out the firm of Tuttle, Hibbard & Co., wholesale hardware dealers at State and Lake streets. He continued a member of that firm and of its successors, Hibbard & Spencer, until the conflagration which destroyed the greater part of the city and included in its ruins the business of the concern. Through the energy and vigilance of Mr. Spencer and others, however, the books and papers of the house were saved with an insignificant quantity of the stock. Immediately afterward, undaunted by the disaster and unmoved by the doubt and uncertainty that naturally followed, the firm laid in a large stock of goods, its credit having been very high, and proceeded to rebuild its business and rehabilitate the fortunes of the house. The growth of the firm from that time was remarkably rapid, and in 1882 it was incorporated under the present name of Hibbard, Spencer, Bartlett & Co., A. C. Bartlett having been admitted to partnership in the interval, and its business has become such as to entitle the establishment to rank as one of the two or three largest Hardware jobbing concerns in the country.

Mr. Spencer had never held public office, nor was he at any time officially connected with any charitable institution, but it is stated that there is hardly a charity in Chicago that has not experienced his generosity. He had great business ability and his integrity was unquestioned. Mr. Spencer was a man of thoroughly domestic tastes, and was devoted to his home and family. The appreciative tributes which are paid to his memory are hearty and sincere, and reflect the high regard in which he was held and the exalted place he occupied in the public esteem.

FRANKLIN FAYETTE SPENCER.

Born 1817. Died 1890.

Price-Lists, &c.

MERWIN, HULBERT & CO., 26 West Twenty-third street, New York, manufacturers of Arms and Ammunition, issue an illustrated catalogue and price-list, No. 33, under date October, 1890. Particular attention is directed to their Junior Rifle, 32 Caliber Automatic Ejecting Hinge Revolver, Rifles with interchangeable Shot Barrels 20 and 16 gauge, and Single Breech Loading Shot Guns. They also issue a special price-list to apply to this catalogue, containing illustrations of the goods referred to, a novel feature of which is that prices have the appearance of being entered with pen and ink.

The Electric Cutlery Company, 91 Chambers street, New York, and Newark, N. J., issue illustrated catalogues relating to Razors and Razor Strops. Fourteen styles of Razors are shown, each style being made in ⅛, ⅜ and ½ inch widths. The company call attention to the fact that they carry a complete line of Plush and Leather Fancy Cases for Razors, also Seven Day Cases of any pattern desired. In Strops are shown Cushion Pad Strops, Combination Strops, Belt Strops and Strops to swing.

Taylor Bros. Company, Rochester, N.Y., manufacturers of Thermometers, Barometers and Hydrometers, issue cards illustrating their holiday novelties. They have a line of 100 numbers in these fancy goods. These articles all have Thermometers attached. An idea of the assortment may be received from the following partial list of designs: Broiler Match Safe, Banjo Calendar, Battle Axe, Shaving Paper with Mirror, Bellows and Tongs Pin Cushion, Scythe Key Rack, Horn Match Safe, &c. In an illustrated catalogue and price-list of Thermometers, published by the same firm, particular attention is directed to their Radial Scale Thermometer. This is intended to be hung from a chandelier or an object away from the wall, to register the true temperature of the air. The construction of the Thermometer is such that its readings are noted from all sides, the figures being large and plain. The tube and ball are protected, which renders them less liable to be broken.

Fletcher, Jenks & Co., Detroit, Mich., have issued Supplement No. 1 to their 1889 catalogue. This relates to plain Bronze Locks, Knobs, &c. Illustrations show Mortise Knob Locks, Mortise Front Door Night Locks, Mortise Front Door and Vestibule Locks, Mortise Sliding Door Locks, Door Knobs, Escutcheons, Store Door Handles, Loose Pin Butts, Flush Bolts, &c.

The Brown, Hinman & Huntington Company, Columbus, Ohio, issue a catalogue and illustrated price-list of their Farm and Garden Tools for 1890and 1891. This shows their full line of Suaths, Cradles, Forks, Hoes, Rakes, &c., and is printed in their usual attractive ssyle.

The Worcester Machine Screw Company, Worcester, Mass,, issue cloth bound catalogue and price-list descriptive of Standard Machine Screws of every description, in iron, steel or brass, also Studs for Steam Engines, Pumps, &c., and Machinists' Taps, as manufactured by them.

Seymour Smith & Son, Oakville, Conn., manufacturers of Hardware, send us a sample of the Flat Spring which they use on their Nos. 7 and 21 Pruning Shears. This Spring is graded from No. 13 gauge at the base to No. 18 gauge at the tip. It is referred to as making a spring that will bend its entire length, instead of at one point only, as in the case of springs of

uniform thickness, and as adding much to the ease of working the Shears, besides being one of the most durable forms of spring in use.

The Whitman & Barnes Mfg. Company, Cincinnati, Ohio, issue an illustrated catalogue and price-list of Mower Knives, Reaper Sickles, Mower Sections, Mower Guards, Spring Keys and Colters, Machine Repairs, Plow Repairs, Binder Twines, Binder Covers and other Agricultural Implement Supplies. The catalogue covers a large range of articles which are of interest to those handling this line of goods.

I. L. Ellwood Mfg. Company, of DeKalb, Ill., are distributing a pocket memorandum book for 1891 of heavy paper advertising the Glidden Fence Wire, which is made in the Regular or Cattle Wire and also in Thickset or Hog Wire. They manufacture all kinds of Mineral Paints in connection with their Wire business.

Chas. Morrill, 79 Chambers street, New York, issues a circular price-list relating to his Perfect Saw Set, Perfect Bench Stop and Giant Saw Set. The No. 11 Saw Set differs only from No. 1 in its adjustment. The rest that is on the under side of the set is held in place and adjusted back and forward by a horizontal screw that passes through a lug on the body of the Set.

The St. Joseph Mfg. Company, Mushawaka, Ind., manufacturers of Cultivators, Sulky Plows, &c., are putting on the market a patent Detachable Point Cultivator Shovel, which, they state, is meeting with great success. The body and the point of the Shovel are separate, the point being fastened to the main part by one bolt. The advantage this style of Shovel has over the ordinary pattern is the saving of cost when new Shovels are required. It is estimated that in replacing a set of worn out Shovels a saving of two-thirds of the cost of entire new Shovels may be made by using Shovels with detachable points.

The Binghampton Wagon Company, Binghamton, N. Y., issue a tastefully arranged colored circular illustrating their Banner Wagon. This is a one seated road wagon, with the Banner gear and springs, finished in natural wood or paint. The manufcturers claim many points of advantage in the construction of this wagon.

David Round & Son, Cleveland & Findlay, Ohio, importers and dealers in Differential Pulley Blocks and manufacturers of Coil and Cable Chains, issue illustrated circulars and price-lists of Eade's Patent Pulley Blocks, Weston's Improved Geared Differential Pulley Blocks, Helical Pulley Blocks with lubricated counter weight and Weston's Improved Differential Pulley Blocks with guide.

Whitfield & Jacobs, Pontiac, Mich., issue a descriptive price-list illustrating the Buckell Safety Clevis as manufactured by them. They claim as points of advantage that the Pins cannot loose out, that they can be changed from one implement to another without the aid of a Wrench, and that the Clevis can be used as a ring when needed.

The Knowles Scale Works, Wm. H. Thompson, proprietor, Lowell, Mass., send us illustrated circulars of Standard Scales. These are made in Platform, Union, Even Balance, Counter Scales, &c., and each Scale warranted by the manufacturer accurate and durable. It is stated that after November 1 the appearance of their Union Scales will be greatly improved.

The Lovell Mfg. Company, Erie, Pa., issue an illustrated catalogue of their goods. Among others are Clothes Wringers, Clothes Mangles, Hammoquette Reclining Chairs, Delusion and Bonanza Mouse Traps, Easy Setting Chocker Mouse Traps, Erie and Gem Rat Traps.

The St. Nicholas Mfg. Company, Chicago, Ill., issue their thirteenth semi-annual catalogue of American Wheels manufactured by them. These goods are illustrated in various styles of Safety and other Bicycles, Tricycles and Velocipedes.

Woods, Sherwood & Co., Lowell, Mass., issue an illustrated catalogue and price-list of Sherwood's Patent Standard White Lustral Wire Ware, including their Diamond W. S. & Co. Gold Plated Goods and other specialties. Their trade-mark is registered, the pivotal word being Lustral. A series of cards, five in number, accompany the catalogue, illustrating Sherwood's Broiler, in comparison with the ordinary style.

The White Mfg. Company, Bridgeport, Conn., issue an illustrated catalogue and price-list of their Coach and Carriage Lamps and Mountings. These goods are presented in large assortment, including Rim Bands, Door Handles, Morocco Covered Trimmings, Celluloid Trimmings, Name Plates, Screw Knobs and Plates, &c. A discount sheet accompanies the catalogue.

Cragg Bros. & Co, Halifax, N. S., wholesalers and retailers, issue an illustrated catalogue of House Furnishing Hardware and Cutlery. The list is printed by Thatcher W. Root, Detroit, Mich. They refer to their department of Builders' Hardware as containing the most popular lines produced in the United States and Canada, and as under their control for that section.

The Seymour Mfg Company, Seymour, Ind., and St. Louis, Mo., manufacturers of Grain Cradles, Scythe Snaths and Spokes, issue an illustrated price-list for 1890–91. These Cradles and Snaths are made in a large variety of patterns. Attention is called to their Seymour Hand Made Cradle, also to the Joshua Berry Fourteen Finger Cradle.

REVIEW OF THE WHOLESALE MARKET IN PAINTS AND OILS.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

Paints and Colors.

Distributors of the general line of staple Paints and Colors report a fairly active movement of supplies into the channels of consumption. Most accounts, as a matter of fact, indicate that trade has been better the past week or ten days than during any corresponding period since early in the fall season. A similar report is made by manufacturers in several instances, and, upon the whole, the market appears to be in very good shape. There have been no important changes in values; no tendency in the downward direction is manifested in any quarter, and all recent advances are well maintained.

White Lead.—Crude material for prompt delivery is somewhat cheaper, but the cost is yet relatively higher, than that of supplies purchased some time ago for future delivery and now coming forward. Corroders therefore adhere to the old list for White Lead, and jobbers are making no greater concessions than they have in the past. In other words, the market looks very steady, and it is the general report that sales of both pure pigment and the inferior varieties are at present fully up to the average volume for the season.

Red Lead and Litharge.—The market is without change. Purchases run along in about the usual manner for this season of the year and the market is firm, with former prices current.

Zincs.—The demand for both American and Foreign Oxide for prompt delivery has been very fair, and owing to the high cost of the imported article, domestic moves off nicely at the recently advanced prices. A considerable portion of next year's probable output of domestic is already under contract at prices averaging 4¼¢ and new orders are being steadily booked. Purchases of foreign, however, are chiefly on hand-to-mouth lines.

Colors, &c.—For the general line of staple Colors employed by house painters and grinders there has been a very steady demand and the market shows good form, with prices fairly firm throughout and the situation favorable. In ready mixed Paints and other specialties there has been a rather larger business, chiefly at stiff prices.

Miscellaneous.— The situation of the Chalk market is unchanged and manufacturers quote former prices for Whiting, at which there is a very fair business passing. Paris White and Clays generally find fair sale at old prices.

Oils and Turpentine.

The changes in the market for Animal and Vegetable Oils have been very few, and slight ones at that. Prices stand almost precisely as they were a week ago; for that matter, the character of the business passing is very similar as well, and there are no signs of any new advantage likely to be gained by either buyers or sellers in the immediate future unless some radical and unlooked for turn in the market for certain crude materials shall take place.

Linseed Oil.—Western brands are said to have been offered at as low as 57½¢ for future delivery here, but the alleged offers seem to have been of a rather peculiar nature, and it is not learned that any sales were made. For prompt delivery 59¢ is quoted. City crushers hold to their old prices, 62¢ for domestic and 64¢ for Calcutta seed product, and remark that their sales are not visibly affected by the alleged low Western quotations.

Cotton Seed Oils.—Business in this line continues rather slow. Exporters manifest indifferent interest, probably because of the fact that there is yet a large supply in the foreign markets, and home trade buyers purchase reservedly. Prices for strictly prime quality are firm, 28¢ for crude and 34¢ for Summer Yellow having been paid, but on the lower grades values are very irregular.

Lard Oil.—Present make prime remains steady in price at 51¢ for popular city brands and 50¢ @ 50½¢ for outside brands. The demand is running fairly large, and full enough to affect the decline in cost of raw material.

Fish Oils.—There has been no important movement the past week in crude Sperm or crude Menhaden Oils, and prices have remained very steady. The manufactured products continue to find very steady sale and are without change in value. Whale Oils are in very light supply. There is no crude stock outside of manufacturers' hands.

Miscellaneous.—Ceylon Cocoanut Oil has been more freely offered and is a shade weaker, with sales reported of 30 tons at 7⅛¢ on the spot. Olive and Palm Oils are fairly steady, but rather slow of sale at the moment.

Spirits Turpentine.—Receipts at this point have been sufficient to keep the supply up to between 1300 and 1500 barrels during the greater portion of the week. The demand has run very fairly, however, and prices have been quite steady at 40½¢ @ 41¢, as to style of package.

Charlton's Detachable Meat Hook.

Wm. J. Lloyd Mfg. Company, Philadelphia, Pa., are introducing Charlton's Detachable Meat Hook, as illustrated herewith, which is a full size cut of No. 2. It is made in two parts, consisting of a T hook

Fig. 1.—Plate of Detachable Meat Hook.

and a plate, as shown in Figs. 1 and 2. The hook is placed in the plate, turned and drawn down into the lower slot. The binding of the T slightly on the wood frame is intended to hold it perfectly secure. This hook is referred to as being simple to adjust and easily taken apart to

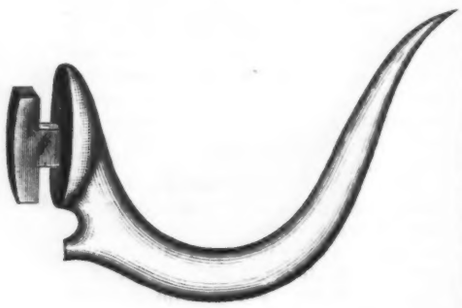


Fig. 2.—Hook of Detachable Meat Hook.

clean. It is made of malleable iron, tinned, and packed with tinned screws, one-quarter gross in a box. Price will be found in our Trade Report of this issue.

Wire Cutting Nipper.

The accompanying cut illustrates a new Wire Cutting Nipper, now placed on the market by the Niagara Stamping and Tool

Wire Cutting Nipper.

Company, of Buffalo, N. Y., under letters patent. The makers claim for this that rivets, wire, &c., can be cut to any desired length squarely to the length of the same and at the middle of the blades or cutters. The two levers or handles are pivoted to each other, and have a recess between the sides between which the rivet or wire can be passed, and can thus be cut square off. This cannot be done with nippers which cut at either side, thereby causing the blade to wear or break at its weakest part, and making a diagonal cut, difficult to rivet and otherwise undesirable.

Metallic Filing Case or Cabinet.

An example of the constantly growing use of sheet metal for constructive purposes is shown by a patent recently granted to Philip H. Yawman, of Rochester, N. Y., for a metallic filing case or cabinet. In this case the frame consists of vertical side plates, with top and bottom plates connected throughout by inwardly turned flanges and rivets. A back plate inserted within this frame has its edges flanged and secured by rivets. The vertical side plates have lips punched inward for the purpose of engaging with the division plates or shelves, the ends of which are also flanged. The vertical and horizontal plates are each curled into tubular form at one edge, an angular tie iron having its ends inserted into the tubular portions of the respective plates. The shelves are inserted by sliding them horizontally to their place from the front and rear of the case, and are held in place simply by friction, or by providing them at the rear edge with a downwardly turned flange to be riveted or otherwise attached to the back plate. The vertical division plates by which the spaces between the shelves are divided into pigeon holes consist each of a single piece of metal. These plates are seated between and against the horizontal shelves and between the shelves and the top and bottom plates of the case, and are secured in position by means of lips punched through the shelves. When the case is designed to receive books, what are known as "roller shelves" are provided. In order to prevent the books from becoming chafed in their sides or edges, more especially large books inserted in horizontal positions, a vertical roller is provided at the front of each of the division plates. This roller is sustained at its ends in ears or plates riveted to the vertical plate. Mr. Yawman has assigned his interest in the patent to the Office Specialty Mfg. Co., New York.

NEW PUBLICATIONS.

NOTES ON GAS LIGHTING AND GASFITTING. By William Paul Gerhard, C. E., 36 Union square, New York. Price 25 cents.

The pamphlet carrying the above title is a small sized publication of 54 pages, and consists of articles reprinted from the *Builder, Decorator and Woodworker*, to which they were contributed by Mr. Gerhard. The author is well known as a sanitary expert, and has acquired a wide reputation for both practical work and as a writer on sanitary and kindred topics. The pamphlet before us is written more from the sanitarian's point of view than from that of the actual gasfitter; and while it will give many serviceable hints to the architect and owners of buildings, and also will give gasfitters general principles to work upon, we do not find much detailed instruction that would be serviceable in the practical work of fitting a house with gas fixtures and pipes. As a general treatise, however, upon the dangers of faulty gas fitting and the general rules to be followed in securing good results, we can heartily recommend the pamphlet to the reading public. The first 30 pages or so describe broadly the requirements of a good gas piping system, and quite extended reference is made to the dangers and discomforts that attend leaks and improper construction. The author then proceeds to consider the different forms of burners, the names of which are explained; also gas fixtures of various sorts, pointing out their relative advantages and disadvantages. Toward the close of the book is given a specification for gas piping, and this is followed by some hints to consumers of gas, which can be read with profit by a large portion of the public.

CONTENTS.

Making Cast Iron Pipe. Illustrated 787
The Southern Tour 791
Providence Miscellany 794
Upright Drill. Illustrated 794
New Express Rates 794
Automatic Threading and Nut Tapping Machine. Illustrated 795
A Novel Question in Trade-Mark Law 795
Tapping and Reaming Machine. Illustrated 796
Grinding and Polishing Machine. Illus 796
Protecting Puddlers from Heat 796
Notes by a German Engineer 797
Rotary Steel Wire Brushes. Illustrated 798
Double Grip Drill Chuck. Illustrated 798
Southern Miscellany 798
Production of Steel 799
An Intercontinental Railway 800
The Boiler Manufacturers 800
The Radford Pipe and Foundry Company 801
A New Meat Packing City 801
New England Items 801
Modern Blast Furnace Construction.—III. Illustrated 802
The Week 804
Manufacturing: Iron and Steel, Machinery, Hardware, Miscellaneous 805, 806
Personals 806
Editorials:
The Steel Rail Market 807
Natural Gas in Pittsburgh 807
Steel Making in the South 808
The Canadian Iron Market 808
Good-Bye to the Iron and Steel Institute 809
The Industries of Pittsourgh, Kan 809
Obituary 809
The Selection and Use of Emery Wheels 810
Trade Report: Chicago, Philadelphia, Detroit, Pittsburgh, Chattanooga, Cincinnati, Cleveland, St. Louis, Louisville, New York, Imports, Coal Market, Metal Market, Financial, British Iron and Metal Markets 811-815
Trial of the Newark 816
Hardware: The Condition of Trade, Prices, Cordage, Targets and Traps, Trade Items, When, Exports, Franklin F. Spencer (Portrait), Price-Lists, &c 817-822
Review of the Wholesale Market in Paints and Oils: Paints and Colors, Oils and Turpentine 823
Charlton's Detachable Meat Hook. Illus 824
Wire Cutting Nipper. Illustrated 824
Metallic Filing Case or Cabinet 824
New Publications 824
Cary's Box Fastenings. Illustrated 825
Hull's Combination Tool. Illustrated 825
Fiber Head Chisel Handle. Illustrated 825
Triumph Toilet Clipper. Illustrated 825
The American Pipe Hanger. Illustrated 826
The Dart Typewriter and Marker. Illus 826
Adjustable Lever Spring Bolt Barber Shears. Illustrated 826
Cook Stove Garbage Burner. Illustrated 827
Bevel and Rake Guide. Illustrated 827
The Marion Harland Coffee Pot. Illustrated 827
The New Process Cabbage Strainer. Illus 827
Current Hardware Prices 828-833
Paints, Oils and Colors 833
Current Metal Prices 834

Cary's Box Fastenings.

The Cary Mfg. Company, 41 and 43 Centre street, New York, are putting on the market box and corner fastenings as

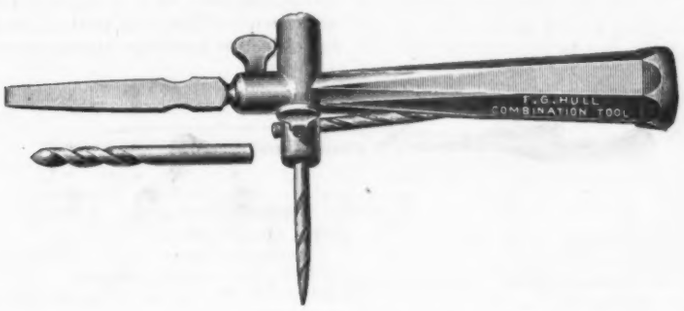
Fig. 1.—Cary's Box Fastening.

shown in Fig. 1. These fastenings are all made flat, as shown on top of the case in Fig. 2, and when used for corners are bent at right angles as they are applied to the case. These fastenings are to be applied without the use of nails for protecting the corners of packing cases, crates, &c., fastening small boxes together, and other similar purposes. When used for fastening boxes and other articles together for shipping it is suggested that two nails be used with each fastening, one driven through the fastening into the top and one into the bottom of adjoining boxes as they are put together. Fig. 2 shows various applications that may be made for strengthening all kinds of cases, crates, &c.

Fig. 2.—Cary's Box Fastenings in Use.

Hull's Combination Tool.

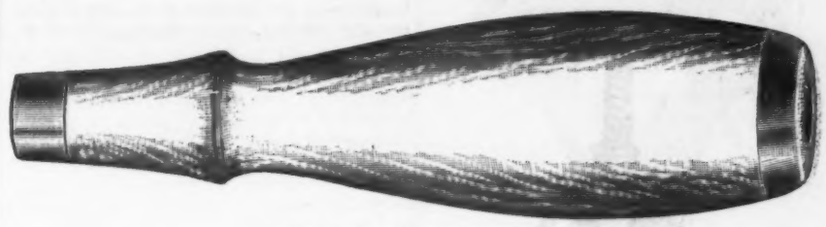
F. G. Hull, Plainville, Conn., is introducing a combination tool, as illustrated herewith. This consists of screw driver, brad awl, drive bit, hammer and wrench. The drive bit is interchangeable with the screw driver in the handle. The wrench is used for screwing in blind hooks after the hole is made with the drive bit, instead of boring. The brad awl is for screws, to be driven or forced in with the hand. The advantage is pointed out of having hammer, brad awl, screw driver, wrench and drive bit, five tools, all in hand, ready for use, instead of laying one down and picking up another. This combination tool is referred to as being particularly useful in hanging blinds, also for putting trimmings on inside of house.



Hull's Combination Tool.

Fiber Head Chisel Handle.

E. C. Stearns & Co., Syracuse, N. Y., are introducing a fiber head chisel handle, as illustrated herewith. The fiber is the same as is used for their fiber head mallet, described in our last issue. The manufacturers describe an interesting test of the chisel handle made a short time since. They state that a small hole was bored in a thich, hard wood plank, the lower end of the chisel handle was inserted in it, and the handle was subjected to continuous blows from an 18-pound iron sledge. As the handle was driven into the hole the friction caused it to sliver up from the bottom and parted the grain of the wood. The fiber showed no impression itself, and was as solid as before the test. They refer to the test as conclusive evidence of the durability of the fiber head. The point is made that very desirable results may be obtained from using their fiber head mallets and chisel handles in connection with each other.



Fiber Head Chisel Handle.

Triumph Toilet Clipper.

Jesse Lee & Sons, 37 South Fourth street, Philadelphia, Pa., are introducing the Triumph Toilet Clipper, as illustrated herewith. It will be noticed that there is but a single spring, which is attached to one handle, while the tip bears against a rocking bar attached to the opposite handle. This arrangement is referred to as serving several useful purposes. The bar has two forks (it may have any number), and by adjusting the spring against the longer or the shorter fork the power of the spring may be increased or diminished. By unshipping the fork from the spring, which is done by pressing the spring toward the handle and letting the tip of the fork drop, it is stated that the clipper may be taken apart without further trouble, as easily as though it had no springs. It is intimated that the trouble which is experienced in taking apart and putting together clippers with either V or coil springs is not encountered in the Triumph. Ball bearings are placed between the cap and top plate to reduce the friction, and to reduce the amount of spring power required to carry the plate on the back cut. The clipper is alluded to as working very easily, especially after a little use, when the bearings have got the perfect set to each other.

Triumph Toilet Clipper.

Canada is looking to the West Indies for the increase of her foreign markets, to compensate for the losses from restricted traffic with the United States. Since confederation repeated attempts have been made to stimulate trade in that direction, but with little success. Canada's average annual trade with the whole of the West Indies and South America is at present about $8,500,000. This shows a gain of only $2,000,000 in ten years, and this mainly from the Spanish islands and South America. That there is an important trade to develop with the British West Indies especially Canada is confident.

The American Pipe Hanger.

A new form of pipe hanger, the American, which we illustrate in the accompanying cuts, is being put on the market by Richard K. Cooke, 92 Centre street, New York. The principal advantage claimed for this article is that a line of hangers can be run and the pipe hung

The American Pipe Hanger.—Fig. 1.—General View of Hanger.

afterward without taking the hangers apart. In other words, the three-quarter part of the hanger can be adjusted as shown in Fig. 2, making a hook, into which the pipe can be dropped and the side piece afterward put in position, making the complete hanger shown in Fig. 1. It is pointed out that this construction does away with all tying or holding of the pipe while adjusting the hanger, which is ordinarily such a troublesome piece of work. In addition to this special feature the American pipe hanger swings so as to allow for expansion and contraction, and furthermore, the lag

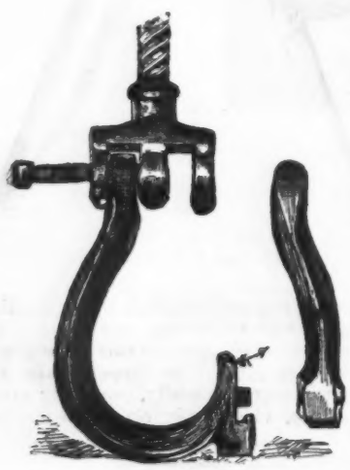


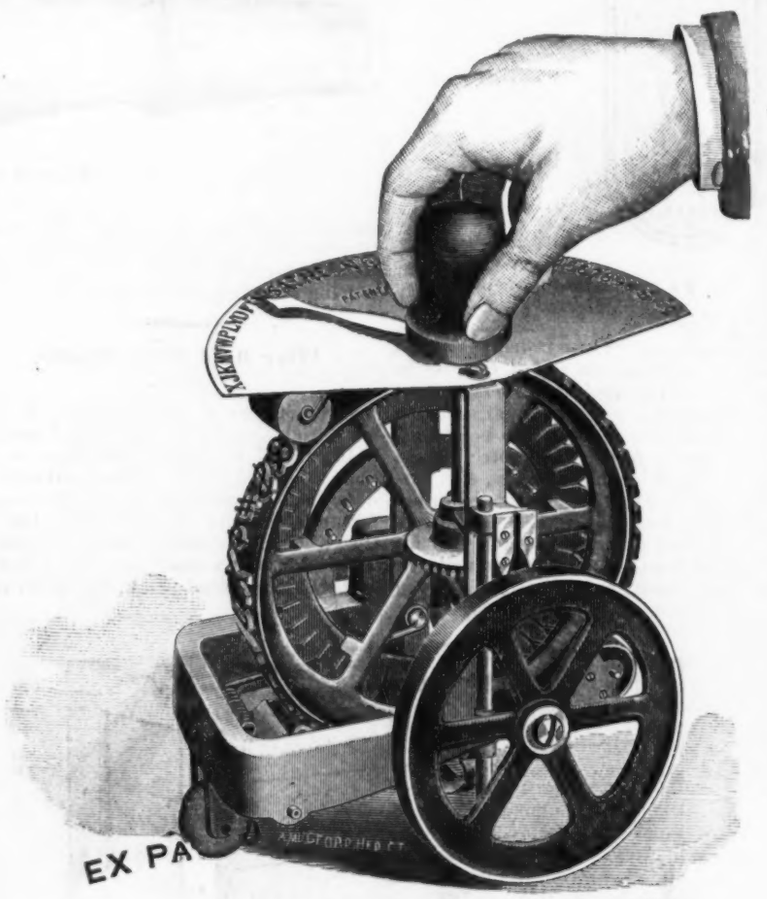
Fig. 2.—Hanger with Side Removed.

screws can be adjusted to any length. The socket of the hanger is made of malleable iron and has three shanks, as shown in the illustration, thus giving it added strength. These hangers are made in all sizes for pipe from ⅜ inch to 14 inches in diameter.

An English company in Peru, who employ American drillers from Pennsylvania, are enlarging their works, and expect soon to control the oil trade of South America, besides exporting to China and Japan.

The Dart Typewriter and Marker.

The Connecticut Mfg. Company, Hartford, Conn., are introducing a typewriter and marker, as illustrated herewith. This is intended for business men, manufacturers and jobbers, wholesalers and retailers,



The Dart Typewriter and Marker.

and is referred to as a practical marking machine. The uses to which the machine can be put are enumerated as addressing boxes, parcels, &c., printing notices, display cards for stores, price tickets, bills of fare, &c. It prints letters 1 inch high, is self inking, moving on wheels over the surface printed on, prints each letter at a single stroke, and spans accurately between words and letters. The marker is to run at right angles with the person using it, so that the small trail wheel of the machine will be at the left hand. The cut represents the words "Express Paid" as having been printed. In using, the operator grasps the knob on top of the machine lightly in the hand and turns the pointer on the dial to the letter or figure to be printed. The knob is then pressed downward with sufficient force to make a good impression, when the vibrating frame is allowed to come back to place without removing the hand from the knob. The trail wheel in the real of the marker is used as a guide in spacing between lines. The statement is made that it can be operated by any man or boy with but a few minutes practice.

Adjustable Lever Spring Bolt Barber Shears.

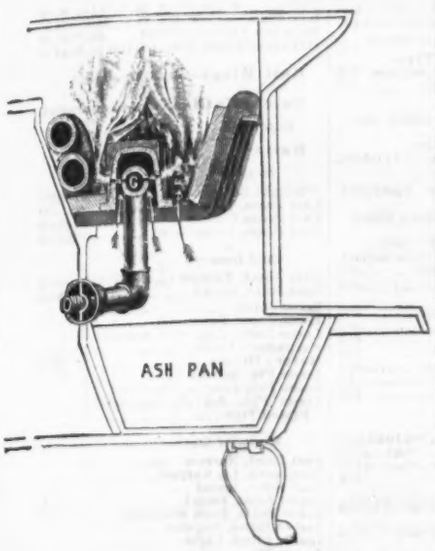
The Henry Seymour Cutlery Company, Holyoke, Mass., are adapting their adjustable lever spring bolt to barber shears, as illustrated herewith. The following advantages are referred to as resulting to barbers' shears from this attachment: That there are no loose bolts; that the shears are easily taken apart by the operator to clean and sharpen; that they can be adjusted to run tight or loose at will; that they work easier, increasing the cutting power, and that no pressure is required on the handles to keep the edges together. The manufacturers state that these goods are meeting with marked success.

Improved Barbers' Shears.

The Reading Railroad more than a year ago commenced buying property and tearing down buildings in Philadelphia with the object of reaching Market street and improving its terminals, with the expectation of putting something like $7,000,000 in new improvements, but thus far the scheme has been balked by the opposition of the City Councils. Meanwhile the city suffers for want of rapid transit.

Cook Stove Garbage Burner.

The illustration herewith presented gives a sectional view of the Cook Stove Garbage Burner for use with natural gas, made by the Standard Mfg. Company, Pittsburgh, Pa., the cut showing the burner in place. The aim of this burner is to prevent the stoppage of openings in the distributing pipe by the refuse in process of combustion. The burner or distributing pipe is protected by an outer shell of cast iron,

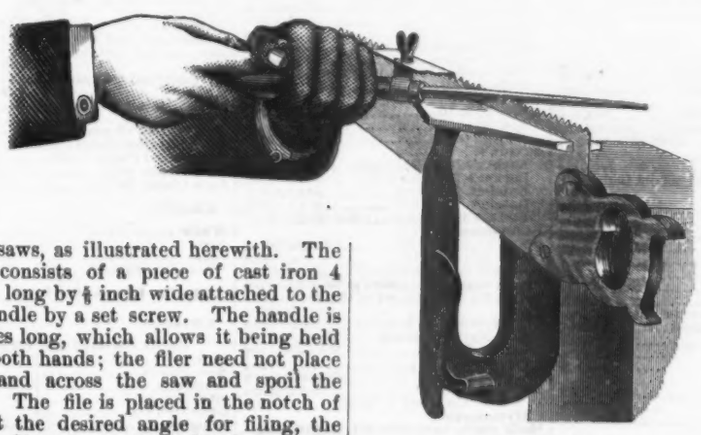


Cook Stove Garbage Burner.

which is open to receive draft air, or, more properly, such air as may be drawn through the grate by force of the chimney draft. The air passes through in close contact with gas which has already received a portion of air at the burner or mixer. Several advantages are claimed for this outer shell. It is stated that the wrought iron center is preserved from overheating and consequent oxidation about the openings through which the gas is distributed. A further advantage is that the air is superheated in the second mixture and a greater effective duty secured. Also, the shell dispenses with the use of firebrick, and permits all garbage to be burned while the range is in use. The burner is made in two sizes, 13 and 15 inches, with either end or center connection.

Bevel and Rake Guide.

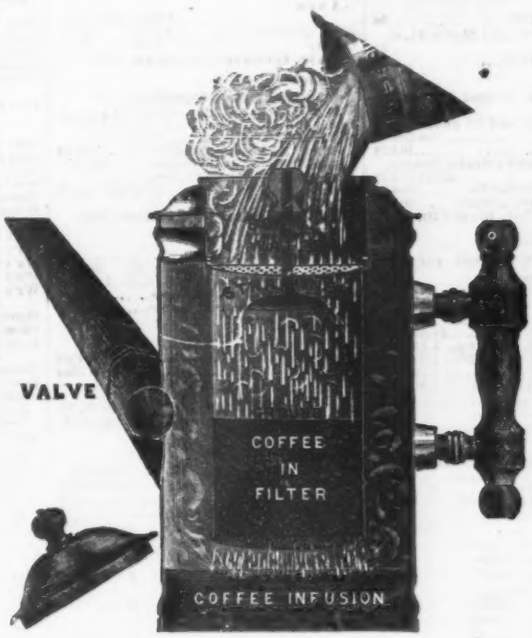
Wm. Rutlan, Picton, Ont., is introducing a bevel and rake guide of which he is manufacturer and patentee, for sharpening saws, as illustrated herewith. The bevel consists of a piece of cast iron 4 inches long by ⅛ inch wide attached to the file handle by a set screw. The handle is 9 inches long, which allows it being held with both hands; the filer need not place one hand across the saw and spoil the light. The file is placed in the notch of saw at the desired angle for filing, the bevel adjusted parallel with the saw and securely fastened by the thumb screw, as shown in the cut. This gives the bevel and rake both at the same time. The rake guide, which is not shown, is a casting about ¼ inch square and 3 inches long, with a notch in the center on two sides. The guide is placed across the file from time to time while filing to get the proper rake or pitch of the saw tooth. It is stated that there is no reason why any man of ordinary ability should not be able to file a saw accurately by using the above device.



Bevel and Rake Guide.

The Marion Harland Coffee Pot.

Silver & Co., 56 Warren street, New York, are introducing the Marion Harland Coffee Pot, as illustrated herewith. The pot is made of tin, nickel plated. The coffee is placed in the filter compartment, which is inclosed with the pot to retain the heat, the construction of the filter being so designed that the boiling water will pass through the ground coffee at a uniform rate. The filtering fabric is made of fine wire cloth. The ball valve in the spout is to prevent the escape of vapor or aroma, and is referred to as doing its work without trouble to the user. The strainer, with its air tube, is arranged to allow both the air and boiling water to pass freely when water is poured on to the coffee and the strainer, allowing the water to rain down evenly on the ground coffee.



The Marion Harland Coffee Pot.

The enameled knob is alluded to as a cold handle for lifting out the strainer, or strainer and filter together. By placing the strainer into the filter and giving it a turn, it is locked in position; then by lifting the knob both the strainer and filter will be removed from the pot. The cover is replaced on the pot after the filter and strainer are removed and the pot is ready for use on the table.

The New Process Cabbage Strainer.

Silver & Co., 56 Warren street, New York, are introducing a cabbage strainer,

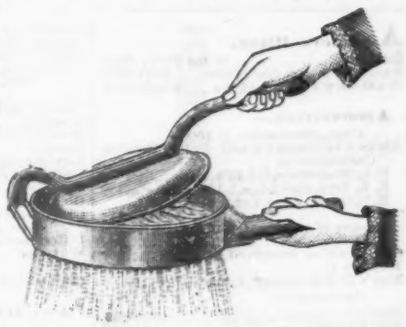


Fig. 1.—S. & Co.'s New Process Cabbage Strainer.

as illustrated in Figs. 1 and 2. The purpose of the strainer is to press the water from cabbage and other vegetables, as shown in Fig. 1. Fig. 2 illustrates the shape into which the vegetable is pressed by straining, suitable for placing on the table.

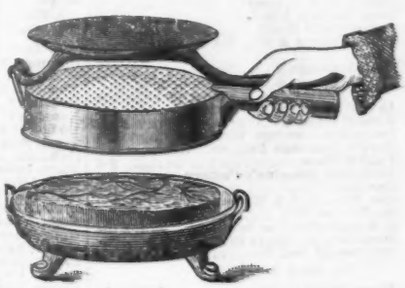


Fig. 2.—Preparing Vegetable for Table.

The Third Avenue Railroad Company are raising several million dollars by increasing their capital stock preparatory to laying a street cable and extending the Tenth avenue system.

CURRENT HARDWARE PRICES.

NOVEMBER 5, 1890.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

Adjusters, Blind.

Domestic.....₩ doz $3.00, 33⅓%
Excelsior.....₩ doz $10.00.....50&10&2%
Washburn's Self-Locking.....20@20&10%

Ammunition.—

Caps, Percussion, ₩ 1000—
Hicks & Goldmark's and Union Metallic Cartridge Co.
F. L. Waterproof, 1-10's.....34@35¢
E. B. Trimmed Edge, 1-10's.....40@48¢
E. B. Grnd. Edge, Cent. Fire, 1-10's.....45@47¢
Musket Waterproof, 1-10's.....50¢
G. D.....28¢
S. B. Genuine Imported.....45¢
Eley's E. B.....54¢ @ 55¢
Eley's D Waterproof, Central Fire...$1.00

Cartridges—
Rim Fire Cartridges.....50&5&2 %
Rim Fire Military.....15&2 %
Cent. Fire, Pistol and Rifle.....25&5&2 %
Cent. Fire, Military and Sporting 15&5&2 %
Blank Cartridges, except 22 and 32 cal., additional 10 % on above discounts.
Blank Cartridges, 22 cal., $1.75.....2 %
Blank Cartridges, 32 cal. $3.50.....2 %
Primed Shells and Bullets.....15&5&2 %
B. B. Caps, Round Ball, $1.75.....2 %
B. B. Caps, Con. Ball, Swgd., $2.00.....2%

Primers—
Berdan Primers, $1.00.....2%
B. L. Caps (for Sturtevant Shells) $1.00.....2%
All other Primers, $1.20.....2%

Shells—
First quality 4, 8, 10 and 12 gauge.....25&10&2%
First quality, 14, 16 and 20 gauge ($10 list).....30&10&2%
Prize.....40&2%
Star, Club, Rival and Climax brands.....33⅓&10&2%
Selbold's Comb. Shot Shells.....15&2%
Brass Shot Shells, 1st quality.....60&2%
Brass Shot Shells, Club, Rival, Climax.....65&2%

Shells Loaded—
Standard List, July 19, 1890..40&10&5%

Wads—Price per M.

U.M.C.&W. R. A.—B. E., 11 up...	68¢
U.M.C.&W. R. A.—B. E., 9&10...	82¢
U.M.C.&W. R. A.—B. E., 8.....	96¢
U.M.C.& W.R. A.—B. E., 7.....	$1.10
U.M.C.&W. R. A.—P. E., 11 up..	1.15
U.M.C.&W. R. A.—P. E., 9&10..	1.50
U.M.C.&W. R. A.—P. E., 8.....	1.70
U.M.C.&W.R. A.—P. E., 7.....	1.80
Eley's B. E., 11 up.....	$1.75
Eley's P. E., 11@20.....	2.80

Dis.50&2

Anvils.—

Eagle Anvils, ₩ ℔ 10¢.....15@15&5%
Peter Wright's.....11½¢
Armitage's Mouse Hole.....10½@11¢
Armitage's Mouse Hole, Extra...12@12½¢
Trenton.....10@10½¢
Wilkinson's.....10½@11¢
Moore & Barnes Mfg. Co.....33⅓%

Anvil Vise and Drill—
Millers Falls Co., $18.00.....20%
Cheney Anvil and Vise.....25%
Allen Anvil and Vise, $3.00.....40&10%
Star.....45&5%

Apple Parers—See Parers, Apple, &c.

Augers and Bits—

Douglass Mfg. Co.
Wm. A. Ives & Co.
Humphreysville Mfg. Co.
French, Swift & Co. (F. H. Beecher,...
P. S. & W. Co.
Rockford Bit Company.
Cook's, Douglass Mfg. Co.
Cook's, N. H. Copper Co.
70&10%

Cook's, N. H. Copper Co.50&10@50&10&5%
Ives' Circular Lip.....60%
Patent Solid Head.....30%
C. E. Jenning & Co., No. 10, extension lip.....40%
C. E. Jennings & Co., No. 30.....60%
C. E. Jennings & Co., Auger Bits, ₩ set, 32½ quarters, No. 5, $5; No. 30, $3.50..20%
Lewis' Patent Single Twist.....45%
Russell Jennings' Augers and Bits.25&10%
Imitation Jennings' Bits.....60@60&5%
Snell's Jennings Pattern.....60%
Pugh's Black.....20%
Rockford, Jenning's Pattern.....60%
Car Bits.....60@60&10%
Car Bits, P. S. & W. Co.....60&10%
Snell's Car Bits.....60%
L Hommodieu Car Bits.....15&10%
Forstner Pat. Auger Bits.....20%
Cincinnati Bell-Hangers' Bits....30&10%

Bit Stock Drills—
Morse Twist Drills.....50&10&5%
Standard.....50&10&5%
Cleveland.....50&10&5%
Syracuse, for metal.....50&10%
Syracuse, for wood (wood list).30@30&5%
Williams' or Holt's, for metal.50&10&10%
Williams' or Holt's, for wood..40&10%
Cincinnati, for wood.....30&10%
Cincinnati, for metal.....45&10%

Expansive Bits—
Clarks' small, $18; large, $26 ".35@35&5%
Ives' No. 4, ₩ doz $60.....40%
Swan's.....40%
Steer's, No. 1, $26; No. 2, $22.....35%
Stearns' No. 2, $48.....20%

Gimlet Bits—
Common.....₩ gross $2.75@3.25
Diamond.....₩ doz $1.10.....25&10%
Bee.....25@25&5%
Double Cut, Shepardson's.....45@45&10%
Double Cut, Ct, Valley Mfg. Co...30&10%
Double Cut, Hartwell's, ₩ gro.....$5.25
Double Cut, Douglass'.....40&10%
Double Cut, Ives'.....60@60&10%

Hollow Augers—
Ives
French, Swift & Co.
Douglass'
33⅓@33⅓&10%
Bonney's Adjustable, ₩ doz $48...40&10%
Stearns'.....20&10%
Ives' Expansive, each $4.50.....50&5%
Universal Expansive, each $4.50.....20%
Wood's.....25@25&10%
Cincinnati Adjustable.....25&10%
Cincinnati Standard.....25&10%

Ship Augers and Bits—
L'Hommedieu's.....15&10@15&10&5%
Watrous'.....15&10@15&10&10%
Snell's.....15&10@15&10&5%
Snell's Ship Auger Patt'n Car Bits, 15&10@15&10@5%

Awl Hafts—See Hafts, Awl.

Awls, Brad Sets, &c—

Awls, Sewing, Common ₩ gr $1.70, 35%
Awls, Should. Peg, ₩ gr $2.45, 40@40&10%
Awls, Pat. Peg...₩ gr 63¢.....40@40&10%
Awls, Shouldered Brad..2.70 ₩ gr.....35%
Awls, Handled Brad...$7.50 ₩ gr.....45%
Awls, Handled Scratch ₩ gr, $7.50.35&10%
Awls, Socket Scratch, ₩ doz, $1.50.25@30%

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

	Plain.	Beveled.
First quality.....	$8.00	$8.50
Others.....	7.50	8.00

Axle Grease—See Grease, Axle.

Axles—

No. 1, 4½@5¢, No. 2 5½@6¢, Nos. 7 to 14.....55&2%, Nos. 15 to 18.....47½%, Nos. 19 to 22.....70%, 3% cash
Concord Axles, loose collar.....5@6¢
Concord Axles, solid collar.....6@7¢
National Tubular Self-Oiling.....33⅓@33⅓&5%

Bag Holders.—See Holders, Bag.

Balances—

Spring Balances.....40%

No.	2000	30	20
Chatillon, ₩ doz....	$0.80	0.95	1.75 net

Chatillon Straight Balances.....40%
Chatillon Circular Balances.....60&10%

Bars.

Crow—
Cast Steel.....₩ ℔ 4½¢
Iron, Steel Points.....₩ ℔ 3½¢

Basins, Wash—

Standard Fiberware, No. 1, 10½-inch, $2; 12-inch, $2.25; 13½-inch, $2.75; 15-inch, $3.25.

Beams, Scale—

Scale Beams, List Jan. 12, '82...50&10@50&10&5%
Chatillon's No. 1.....40%
Chatillon's No. 2.....50%
Custer's.....33⅓%

Beaters—

Egg—
Dover.....₩ doz $1.50
Duplex (Standard Co.).....₩ doz $1.25
Rival (Standard Co.).....₩ doz $1.00
Duplex Extra Heavy (Standard Co.)..... ₩ doz $3.50
Bryant's.....₩ gro $14.00
Double (H. & R. Mfg. Co.), ₩ gro. No. 0, $12.00; No. 1, $15.00; No. 2.....$36.00
Easy (H. & R. Mfg. Co.).....₩ gro $12.00
Triple (H. & R. Mfg. Co.).....₩ gro $16.50
Spiral (H. & R. Mfg. Co.).....₩ gro $4.50
Improved Acme (H. & R. Mfg. Co.)..... ₩ gro $9.00
Paine, Diehl & Co.'s.....₩ gro $24.00
Silver & Co.....₩ doz $5.50

Culinary—
Keystone, P.D.&C., Each, No. 1, $1; No. 2, $2.....20 %

Bells—

Cow—
Common Wrought.....60&10%
Western.....20&10%
Western, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Kentucky, Sargent's list.....70&10%
Dodge, Genuine Kentucky.....70@70&10%
Texas Star.....50&10@50&10&5%
Call.....40@40&5%
Farm Bells.....₩ ℔ 2¢@3½¢
Steel Alloy Church and School Bells..40%

Door—
Gong, Abbe's.....33⅓&10%
Gong, Yankee.....45&10%
Gong, Barton's.....40&10@50%
Crank, Taylor's.....25&10%
Crank Brooks'.....50&10&2%
Crank Cone's.....10%
Crank, Connel's.....20&10%
Lever, Sargent's.....60&10%
Lever, Taylor's Bronzed or Plated....net
Lever, Taylor's Japanned.....25&10%
Lever, R. E. M. Co.'s.....50&10&2%
Pull, Brook's.....50&10&2%
Pull, Western.....25&10%

Electric,
Wollensak's.....20%
Bigelow & Dowse.....20%
Taylor's.....20%

Hand—
Light Brass.....75&10%
Extra Heavy.....65&10%
White Metal.....60&10&10%
Silver Chime.....33⅓&10%
Globe(Cone's Patent).....25&10@35%

Bellows—

Blacksmiths'.....60&5@65%
Molders'.....40@40&10%
Hand Bellows.....40&10@50%

Belting, Rubber—

Common Standard.....70@70&5%
Standard.....60&10&10@70%
Extra.....50&10@60%
N.Y.B.&P.Co., Carbon...50&5@50&10&5%
N.Y.B.&P.Co., Diamond....40&5@40&10%

Bench Stops—See Stops, Bench.

Benders, Upsetters, Tire.

Stoddard's Lightning Tire Upsetters..15%
Detroit Perfected Tire Bender.....15%

Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Adjusters, Blind.

Blind Fasteners—See Fasteners, Blind.

Blind Staples—See Staples, Blind.

Blocks—

Ordinary Tackle, list May 20, 1889... See Trade Report.
Cleveland Block Co., Mal. Iron.....50%
Moore's Novelty, Mal. Iron.....50%

Boards, Stove.

Wood Lined "Crystal".....50%
"Embossed".....50%
"Oxidized".....45%
Paper Lined Zinc.....55%
"Crystal".....55%
"Embossed".....55%
"Oxidized".....45%

Bolts—

Carriage, Machine, &c.—
Com. list June 10, '84.....70&10&5&2%
Genuine Eagle, list Oct., '84...75&10@80%
Phila. pattern, list Oct. 7, '84..80@80&10%
R.B.&W., old list.....70%
Machine, list Jan. 1, 1890..... 75&10@75&10&5%
Bolt Ends, list Jan. 1, 1890..... 75&10@75&10&5%

Door and Shutter—
Cast Iron Barrel, Square, &c..70@70&10%
Cast Iron Shutter Bolts.....70@70&10%
Cast Iron Chain (Sargent's list)...65&10%
Ives' Patent Door Bolts.....60%
Wrought Barrel.....70@70&10%
Wrought Square.....70@70&10%
Wr't Shutter, all Iron, Stanley's..60&10%
Wr't Shutter, Brass Knob, "..40&10%
Wr't Shutter, Sargent's list.....60&10%
Wr't Sunk Flush, Sargent's list....55&10%
Wr't Sunk Flush, Stanley's list....50&10%
Wr't B.K.Flush. Com'n "....55&10%

Stove and Plow—
Stove.....60%
Plow.....60&5%
R. B. & W., Plow.....55%

Tire—
Common, list Feb. 28, '83.....65%
Port Chester Bolt and Nut Company:
Empire, list Feb 28, '83.....65%
Keystone, Philadel., list Oct. '84....80%
Norway, Phila., list Oct. '84.....75%
American Screw Company:
Norway, Phil., list Oct. 16, '84.....75%
Eagle, Phil., list Oct. 16, '84.....80%
Philadel., list Oct. 16, '84.....80%
Bay State, list Feb. 28, '83.....65%
R.B.&W., Philadel., list Oct. 16, '84....80%

Borers, Tap.

Common and Kind.....20&10%
Ive's Tap Borers.....33⅓&5%
Enterprise Mfg. Co.....20&10@30%
Clark's.....33⅓@35%

Borax.....₩ ℔ 9½@10½¢

Boring Machines—See Machines, Boring.

Bow Pins—See Pins, Bow.

Boxes, Wagon.

Per ℔.....24½¢

Braces.—

American Bit Brace Co.:
Nos. 10, 12, 20.....60&10%
Nos. 11, 21, 24, 27.....70&10%
Nos. 22, 23, 25.....60&10&5%
Nos. 13, 26, 36, 37.....70&10&5%
Ball Braces, net.....$1.12 to $1.25
Amidon's
Barker's Imp'd Plain.....75&10@80%
Barker's Imp. Nickeled....65&10@70%
Ratchet.....75&10@80%
Eclipse Rachet.....60%
Globe Jawed.....40@40&10%
Corner Brace.....40@40&10%
Universal, 8 in., $2.10 10 in.....$2.25
Buffalo Ball.....$1.10@1.15
Barber's,
Nos. 10 to 16.....50%
Nos. 30 to 33.....50%
Nos. 40 to 65.....50&10%
Saxton's,
Barker's Imp. Polished.....75&10@80%
Barker's Imp. Nickeled....65&10@70%
Ratchet, Polished.....50&10@60%
Ratchet, Nickeled.....40&10@50%
Buffalo Ball.....net, $1.10@1.15
Bartholomew's,
Nos. 25, 27 and 30.....50&10@60&5%
Nos. 117, 118, 119.....70@70&5%
Common Ball, American.....$1.00@$1.10
Fray's Genuine Spofford's..50&5@50&10%
Fray's No. 70 to 120, 81 to 123, 207 to 414 50&10%
Ives' New Haven Novelty.....70@70&5%
New Haven Ratchet.....60&5@60&10%
Barber Ratchet.....60&5@60&10%
Barbers.....60&5%
Spofford.....60&5@60&10%
Osgood's Ratchet.....40@40&10@50%
P. S. & W. Co., Peck's Patent.....60%

Brackets—

Shelf plain, Sargent's list, 55&10@55&10&10%
Shelf, fancy, Sargent's list, 60&10@60&10&10%
Reading, plain.....50&10@60&10&5%
Reading, Rosette.....60&10@60&10&10%

Bright Wire Goods—See Wire.

Broilers—

Heuis' Self-	9 inch	10	9x11
Basting.	Per doz	$4.50	5.50	6.50

New Haven.....50%

Buckets, Well.

Galvanized—
Hill's.....₩ doz, 12 qt, $4.25; 14 qt, $5.25
Iron Clad.....₩ doz. 14 qt, $4.25@$4.50
Helwig's Flat Iron Band.....$4.25@4.50
Helwig's Wired Top....₩ doz $4.00@4.25

Bull Rings—See Rings, Bull.

Butcher's Cleavers—See Cleavers Butchers'.

Butts—

Brass—
Wrought Brass.....75&10@80%
Cast Brass, Tiebout's.....50%
Cast Brass, Corbin's, Fast.....33⅓&10%
Cast Brass, Loose Joint.....33⅓&10%

Cast Iron—
Fast Joint, Narrow.....50&10&5@60%
Fast Joint, Broad.....50&10@60%
Loose Joint.
Loose Joint, Japanned.
Loose Joint, Jap. with Acorns.
Parliament Butts.
Mayer's Hinges.
Loose Pin, Acorns.
Loose Pin, Acorns, Japanned...
Loose Pin, Acorns, Japanned, Plated Tips.
70&10@7½

Wrought Steel—
Fast Joint, Narrow.
Fast Joint, Lt. Narrow.
Fast Joint, Broad.
Loose Joint, Broad.
Table Butts, Back Flaps, &c.
Inside Blind, Regular.
Inside Blind, Light.
Loose Pin.
70&10@75%
Bronzed Wrought Butts.....80

Calipers—See Compasses.

Cake, Tee—

Gautier.....₩ ℔ 5½@6¢
Dewicks (Burke).....₩ ℔ 5½@6¢

Can Openers—See Openers, Can.

Cards—

Horse & Curry.....10&10&10&10%
Cotton.....10&10&10%
Wool.....10&10&10%

Carpet Stretchers—See Stretchers Carpet.

Carpet Sweepers—See Sw Carpet.

Cartridges—See Ammunition.

Casters—

Bed.....
Plate.....
Brass....55@55&10%
Others...60@60&10%
Shallow Socket.....
Deep Socket.....40&10%
Yale Casters, list May, 1884...80&10@40%
Yale, Gem.....60@60&5%
Martin's Patent (Phoenix).....45&10@50%
Payson's Anti-friction.....60@60&10%
Giant Truck Casters.....30%
Stationary Truck Casters.....50&10%
Socket Truck Casters.....50%

Cattle Leaders—See Leaders, Cattle.

Chain—

Trace, Wagon and Fancy Chains, List revised April 21, 1890.....50&10@60%

American Coil, in cask lots,	3-16	¼	5-16	⅜	7-16	½	⅝	¾
	$7.75	5.45	4.55	4.00	3.65	3.50	3.40	3.30

Less than cask lots, add ½@¾¢ ₩ ℔.
German Coil, list Oct. 6, 1890 50&10&5@60%
German Halter Chain, list Oct. 6, 1890 50&10&5@60%
Covert Halter.....60&2%
Covert Traces.....35@2%
Covert Heel Chain.....50&2%
Oneida Halter Chain.....60@60&5%
Galvanized Pump Chain.....₩ ℔ 5½@6¢
Jack Chain, Iron.....75&10@80%
Jack Chain, Brass.....75@75&10%

Chalk—

White.....₩ gr 50¢
Red.....₩ gr 70¢
Blue.....₩ gr 85¢
See also Crayons.

Chalk Lines—See Lines.

Chisels—

Socket Framing and Firmer.
P. S. & W.
New Haven.
Witherby.
Mix.
Ohio Tool Co.
.75 @ 75&10
Douglass.....75@75&5%
Buck Bros.....50%
Merrill.....60&10@60&10&5%
L. & I. J. White.....50@50&5%

Tanged and Miscellaneous.
Tanged Firmers.....40&10@50%
Butchers'.....$4.75@5.00
Spear & Jackson's.....$5 to 6
Buck Bros.....30%
Cold Chisels, ₩ ℔.....15@16%

Chucks—

Beach Pat.....each, $3.00.....20%
Morse's Adjustable, each, $7.00, 20@20&5%
Danbury.....each, $6.00, 30@30&5%
Syracuse, Bals Pat.....25%
Skinner's Patent Chucks.
Combination Lathe Chucks.....33⅓%
Universal Lathe Chucks.....40%
Independent Lathe Chucks.....40%
Drill Chucks.....15%
Union Mfg. Co.,
Victor.....$3.50, 25%
Combination.....40%
Universal.....40%
Independent.....40%

Churns.

Tiffin Union No. 1, 5 gallon...$3.25 each
Tiffin Union No. 2, 7 gallon...$3.75 each
Tiffin Union No. 3, 10 gallon...$4.25 each

Clamps—

R. I. Tool Co.'s Wrought Iron.....25%
Adjustable, Cincinnati.....15&10%
Adjustable, Hammers.....15%
Adjustable, Stearn's.....30@30&10%
Stearn's Adjustable Cabinet and Corner.....30@30&10%
Cabinet, Sargent's.....60&10%
Carriage Makers', Sargent's.....70&10%
Carriage Makers', P., S. & W. Co..40&10%
Eberhard Mfg. Co.....40@5@40&10%
Warner's.....40@10@40@10&5%
Saw Clamps, see Vises, Saw Filers'.
Carpenters', Cincinnati.....25&10%

Cleavers.

Butchers'.

Bradley's.....25@30%
L. & I. J. White.....20@5%
Beatty's.....40@40@5%
New Haven Edge Tool Co.'s.....40%
P., S. & W.....33⅓@5@33⅓&10%
Foster Bros.....30%
Schulte, Loboff & Co.....40@40@5%

Clips—

Norway, Axle, ¼ & 5-16.....55@5@5%
2nd grade Norway Axle, ¼ & 5-16 65@5%
Superior Axle Clips.....60%@5@70%
Norway Spring Bar Clips, 5-16..60@5@5%
Wrought-Iron Felloe Clips.....₩ ℔, 5½¢
Steel Felloe Clips.....₩ ℔, 6¢
Baker Axle Clips.....15%

Cloth and Netting, Wire—See Wire, &c.

Cockeyes.....50%

Cocks, Brass.

Hardware list.....50&2%

Coffee Mills—See Mills, Coffee.

Collars, Dog, &c.

Medford Fancy Goods Co.....40&10%
Embossed, Gilt, Pope & Steven's list 30&10%
Leather, Pope & Steven's list.....40%
Brass, Pope & Steven's list.....40%
Chapman Mfg. Company.....50&10@60%

Combs, Curry.

Fitch's.....50&10@50&10&10%
Rubber, per doz $10.00.....20%
Perfect.....50%

Compasses, Dividers, &c.—

Compasses, Calipers, Dividers.70@70&10%
Bemis & Call Co.'s
Dividers.....60&5%
Compasses & Calipers.....50&5%
Wing and Inside or Outside.....50&5%
Double.....60%
(Call's Pat. Inside).....30%
Excelsior.....50%
J. Stevens & Co.'s.....25&10%
Starrett's
Spring Calipers and Dividers....25&10%
Lock Calipers and Dividers.....25%
Combination Dividers.....25%

Coopers' Tools—See Tools, Coopers'.

Cord, Sash—

Common.....₩ ℔ 10@11¢
Patent, good quality.....₩ ℔ 13@13½¢
White Cotton Braided, fair...₩ ℔ 28@29¢
Common Russia Sash.....₩ ℔ 13½¢
Patent " " .....₩ ℔ 15¢
Cable Laid Italian Sash.....₩ ℔ 22@23¢
Indian Cable Laid " .....₩ ℔ 13¢
Silver Lake—
A Quality, White, 50¢.....10&10&5%
A Quality, Drab, 55¢.....10&10&5%
B Quality, White, 50¢.....28@30%
B Quality, Drab, 55¢.....31@33%
C Quality, White (only).....26@27¢
Sylvan Spring, Extra Braided, White, 34¢
Sylvan Spring, Extra Braided, Drab..30¢
Semper Idem, Braided, White.....30¢
Egyptian, India Hemp, Braided.....25¢
Samson—
Braided, White Cotton, 50¢...30@30&5%
Braided, Drab Cotton, 55¢...30@30&5%
Braided, Italian Hemp, 55¢...30@30&5%
Braided, Linen, 80¢.....30@30&5%

Corkscrews—See Screws, Cork.

Corn Knives and Cutters—See Knives, Corn.

Crackers, Nut—

Table (H. & B. Mfg. Co.).....40%
Blake's Pattern.....₩ doz $2.00, 10%
Turner & Seymour Mfg. Co.....50%

Cradles—

Grain.....50&5&2@50&10&2%

Crayons.

White Crayons, ₩ gr, 12¢@12½¢.....10%
D. M. Steward Mfg. Co., Metal Workers, ₩ gr, $2.50.....25%
M. Stewart Mfg. Co., Rolling Mill, ₩ gr, $2.50.....25%
See also Chalk.

Crow Bars—See Bars, Crow.

Curry Combs—See Combs, Curry.

Curtain Pins—See Pins, Curtain.

Cutters—

Meat.

Dixon's ₩ doz.....40&5%
Nos.... 1 2 3 4
$14.00 $17.00 $19.00 00
Woodruff's ₩ doz.....40&5%
Nos.....100 150
$15.00 $18.00
Hales Pattern ₩ doz.....70@70&5%
Nos.....11 12 13
$27.00 $33.00 $45.00
American.....30%
Nos..... 1 2 3 4 B 5
Each.....$5 $7 $10 $25 $50 $60
Enterprise.....30%
Nos.....10 12 22 32 42
Each.....$3 $2.50 $4 $6 $15
Great American Meat Cutter.....30%
Nos 112 116 118 120 122
Each....$2.00 $2.75 $3.00 $2.50 $4.00
Miles' Challenge ₩ doz.....45@45&10%
Nos.....1 2 3
$22.00 $30.00 $40.00
Home No. 1.....₩ doz, $26.00, 55&10%
Draw Cut, each:
Nos..5 2 6 8
$50 $75 $80 $225 .....20@25%
Great American.....30%
Beef Shavers (Enterprise).....20&10@30%
Little Giant.....50%
Chadborn's Smoked Beef Cutter, ₩ doz $66.00

Tobacco.

Champion.....20&10@30%
Wood Bottom.....₩ doz $5.00@$5.25
All Iron.....₩ doz $4.25
Nashua Lock Co.'s..₩ doz, $18.00 50@55%
Wilson's.....55%
Sargents's.....₩ doz, $24, 55&10%
Acme.....₩ doz $20.00, 40%

Washer.

Smith's Pat.....₩ doz $12.00, 20&10&10%
Johnson's.....₩ doz $11.00, 33⅓%
Penny's, ₩ doz Pol. $14; Jap'd, $16.00, 55%
Appleton's.....₩ doz $16.00, 60&10%
Bonney's.....30&10%
Cincinnati.....25&10%

Cutlery—

Beaver Falls & Booth's 33⅓%
Wostenholm....New list in preparation

Dampers, &c—

Dampers, Buffalo.....40&10%
Buffalo Damper Clips.....40&10%
Crown Damper.....40%
Excelsior.....40&10%

Diggers, Post Hole, &c.—

Samson Post Hole Digger, ₩ doz $36.00, 25%
Fletcher Post Hole Augers, ₩ doz $36, 20%
Eureka Diggers.....₩ doz $12.50@14.00
Leed's .....₩ doz $8.00@9.00
Vaughan's Post Hole Auger, ₩ doz $13.00@14.00
Kohler's Little Giant.....₩ doz, $18.00
Kohler's Hercules.....₩ doz. 15.00
Kohler' New Champion.....₩ doz. $9.00
Schniedler.....₩ doz. $18.00
Ryan's Post Hole Diggers..₩ doz $24.00
Cronk's Post Bars, ₩ doz $60.00, 50&5@50&10%
Gibbs Post Hole Digger, ₩ doz $30.00, 50%
Imperial, ₩ doz $15.....45%

Dividers—

See Compasses.

Dog Collars—See Collars, Dog, &c.

Door Springs—See Springs, Door.

Drawers.

Money, ₩ doz.....$18&$20

Drawing Knives—See Knives, Drawing.

Drills and Drill Stocks—

Blacksmiths'.....each $1.75
Blacksmiths' Self-Feeding, each $7.50,20&
Breast, P. S. & W.....40&10%
Breast, Wilson's.....30&5%
Breast, Millers Falls.....each $3.00, 25%
Breast, Bartholomew's....each $2.50, 25&10@40%
Ratchet, Merrill's.....20@20&5%
Ratchet, Ingersoll's.....25%
Ratchet, Parker's.....20@20&5
Ratchet, Whitney's.....20&10%
Retchet, Weston's.....20@25%
Ratchet, Moore's Triple Action..25@30%
Ratchet, Curtis & Curtis.....30%
Whitney's Hand Drill, Plain, $11.00; Adjustable, $12.00.....20&10%
Wilson's Drill Stocks.....10%
Automatic Boring Tools.....$1.75@$1.85

Twist Drills—

Morse.....50&10&5%
Standard.....50&1c &5%
Syracuse (Metal list).....50&10%
Cleveland.....50&10&5%
Williams.....50&10&10%
New Process.....50&10&5%

Drill Bits.—See Augers and Bits.

Drill Chucks.—See Chucks.

Dripping Pans-See Pans, Dripping.

Drivers, Screw.

Douglas Mfg. Co.....20@20&10%
Disston's.....50%
Buck Bros.....30%
Stanley R. & L. Co.'s
Varnished Handles.....65&10%
Black Handles.....60&10%
Sargent & Co.'s
No. 1 Forged Blade.....60&10&10%
Nos. 20, 30 and 60.....60%&10&10%
P. S. & W.....70%
Knapp & Cowles No.1.....60&10&70%
No. 1 Extra.....60@60&10
Nos. 00 & 4.....50&5@50&10&5%
Stearns'.....25&10&5%
Gay & Parsons.....35%
Champion.....25&10%
Clark's Pat.....30@33⅓%
Crawford's Adjustable.....30%
Ellrich's Socket and Ratchet..25@25&.0%
Allard's Spiral, new list.....25%
Kolb's Common Sense ₩ doz $6.00, 25&10%
Syracuse Screw-Driver Bits...30@30&5%
Screw-Driver Bits .....₩ doz. 50@75¢
Screw-Driver Bits, Parr's.....₩ gro $6.25
Fray's Hol. Hdle. Sets, No. 3, $12.00, 25@25&10%
P. D. & Co.'s all Steel.....50%
Cincinnati.....35&10%
Brace Screw Drivers.....25&10%
Buck Bros.' Screw-Driver Bits .... %

Egg Beaters.—See Beaters, Egg.

Egg Poachers.—See Poachers, Egg.

Electric Bell Sets.—See Bells, Electric.

Emery.— No. 4 to No. 54 to Flour, CF

	46 gr.	150 gr.	F. FF.
Kegs, ₩ ℔	4½¢	5 ¢	2½¢
½ kegs, ₩ ℔	4¾¢	5¼¢	2¾¢
¼ kegs, ₩ ℔	5 ¢	5½¢	3 ¢
10-℔ cans, 10 in case	6 ¢	6¾¢	5 ¢
10-℔ cans, less than 10	10 ¢	10 ¢	7¼¢

Enameled and Tinned Ware—See Ware, Hollow.

Escutcheon Pins—See Pins, Escutcheon.

Escutcheons.

Door Lock....Same dis as Door Locks.
Brass Thread.....60@60&10%
Wood.....25%

Expanded Metal.

List No. 5.

Lathing.....10%
Fencing, Painted Sheets.....20%
Netting, Painted Sheets.....30%
Door Mats, Galvanized.....25%
Window Guards, Paneled.....15%
Tree Guards, Paneled.....15%

Fasteners, Blind—

Mackrell's, ₩ doz. $1.00.....20@20&10%
Van Sand's Screw Pat., $15 ₩ gr..60&10%
Van Sand's Old Pat., $15.00 ₩ gr..55&10%
Washburn's Old Pattern, ₩ gr.....$9.00
Merriman's.....New list
Austin & Eddy No. 2009 ₩ gr.....$9.00
Security Gravity, ₩ gr.....$9.00

Faucets.—

Fenn's.....40%
Bohren's Pat. Rubber Ball.....25%
Fenn's Cork Stops.....33⅓%
Star.....60%
Frary's Pat. Petroleum.....40&5&5%
B. & L. B. Co.
West's Lock, Open and Shut Key...50%
Star, Metal Plug, new list.....40%
Lockport, Metal Plug, reduced list..60%
Metallic Key, Leather Lined....60&10@ 60&10&10%
Cork Lined.....70&5@70&10%
Burnside's Red Cedar.....50%
Burnside's Red Cedar, bbl lots....50&10%
John Sommers'
Peerless Best Block Tin Key.....40%
IXL, 1st quality, Cork Lined.....50%
Diamond Lock.....40%
Perfection, Fla. Red Cedar.....50%
Goodenough Cedar.....50%
Boss Metallic Key.....50%
Reliable Cork Lined.....60%
Western Pattern Cork Lined.....50%
Self-Measuring
Enterprise, ₩ doz $50.00.....20&10%
Lane's, ₩ doz $36.00.....25&10%
Victor, ₩ doz $36.00.....25&10%

Felloe Plates—See Plates, Felloe.

Fifth Wheels.—

Derby and Cincinnati.....45&5%
Brewster.....50&5%

Files—

Domestic—

Nicholson Files, Rasps, &c.....60&10@60&10&5%
Nicholson (X. F.) Files.....25%
Nicholson's Royal Files (Seconds).....75%
(extra prices on certain sizes)
Other makers, best brands60&10@%20%20%
Fair brands.....60&10&10@70&5%
Second quality.....70&10@75&10%
Nicholson's Horse Rasps....60&10@60& 10&5%
Heller's Horse Rasps.....50&7½@50&10%
McCaffrey's Horse Rasps.....50&10%
Chelsea Horse Rasps, Hand Cut...50&10%

Imported—

Moss & Gamble....List, April 1, 1883, 15%
Butcher.....Butcher's list, 20%
Stubs.....Stubs list, 25@30%
Turton's.....Turton's list, 20@25%
Greaves' Horse Rasps..American list, 60%

Fixtures.

Grindstone—

Sargent's Patent.....70&10%
Reading Hardware Co.....30&10%
P., S. & W. Co.....50&10%

Fluting Machines—See Machines, Fluting.

Fluting Scissors—See Scissors, Fluting.

Fodder Squeezers—See Squeezers, Fodder.

Forks—

Hay, Manure, &c., Asso List....66⅔@70%
Hay, Manure, &c., Phila. List 60@60&5%
Plated, see Spoons.

Frames—

Saw—

White Vermont.....₩ gro $9.00@10.00
Red, Polished and Varnished.....₩ doz $1.50, 25%

Screen, Window and Door—

Porter's Pat. Window and Door Frame, 33⅓&10%
Warner's Screen Corner Irons...33⅓@ 33⅓&10%
Stearns' Frames and Corners..25@25&10%

Freezers, Ice Cream—

White Mountain.....60@60&5%
Granite State.....65@65&5%
Arctic.....70@70&5%
American.....60%
Buffalo Champion.....65@65&5%
Shepard's Lightning.....65@65&5%
Gem.....65¢
Blizzard.....70%
Double Action Crown.....60%
Crown.....60%
Star.....60%
Peerless and Giant.....60&10%
Zero and Pet.....65&10%
Boss.....65&10&10%
Keystone, P. D. & Co., each, $1.50.....20%

Fruit and Jelly Presses—See Presses, Fruit and Jelly.

Fry Pans—See Pans, Fry.

Funnels.

Gersdorff's Perfection, Standard and Globe; *Tin*, 1 gro., 10%; 2 to 5 gro., 20%; 5 to 10 gro.....30%
Copper, 1 to 6 doz., 15%; 6 to 12 doz., 20%; over 12 doz.....25%

Fuse—

₩ 1000 ft

Common Hemp Fuse, for dry ground..$2.70
Common Cotton Fuse, for dry ground 3.85
Single Taped Fuse, for wet ground.. 3.85
Double Taped Fuse, for very wet gr. 4.85
Triple Taped Fuse, for very wet gr.. 5.60
Small Gutta Percha Fuse, for water. 7.50
Large Gutta Percha Fuse, for water.12.00

Gates, Molasses—

Stebbin's Pattern.....75&10@80%
Stebbin's Genuine.....60&10&10%
Stebbin's Tinned Ends.....40&10%
Chase's Hard Metal.....50&10%
Gush's.....20%
Lincoln's Pattern.....70@70&10%
Weed's.....20&10%
Boss, ₩ doz:
No. 1, $7; No. 2, $8; No. 3, $9; No. 4, $10.....60&10&10%

Gauges.

Marking, Mortise, &c.....60&10%
Starrett's Surface, Center and Scratch. 25&10%
Wire, low list.....10&10%
Wire, Wheeler, Madden & Co.....10%
Wire, Morse's.....25%
Wire, Brown & Sharpe's.....10@20%
Wire, P. S. & W. Co.....10&10%

Gimlets—

Nail and Spike.....60&10&5%
"Eureka" Gimlets.....40&10%
"Diamond" Gimlets.....₩ gr $5.00
Double Cut, Shepardson's.....45@45&5%
Double Cut, Ives'.....60@60&5%
Double Cut, Douglass'.....40&10%
"Bee," ₩ gr $12.....25@25&5%

Glue—

Le Page's Liquid.....25@25&5%
Upton's Liquid.....35%
Le Page & Co.'s Improved Process 25@25&5%

Glue Pots—See Pots, Glue.

Grease, Axle.

Fraser's.....Keg ₩ ℔ 4¢, Pail ₩ ℔ 5¢
Fraser's, in boxes.....₩ gr $9.50
Dixon's Everlasting, in bxs...₩ doz 1 ℔ $1.20; 2 ℔ $2.00
Dixon's Everlasting....10-℔ pails, ea. 35¢
Lower grades, special brands. ₩ gr $5.50@$7.00

Grindstones—

Small, at factory.....₩ ton $7.50@9.00

Grindstone Fixtures—See Fixtures, Grindstone.

Hack Saws—See Saws.

Hafts. Awl.

Sewing, Brass Fer.₩ gr, $3.50.....45&10%
Pat. Sewing, Short. $1.00 ₩ doz.....40&10%
Pat. Sewing, Long.....₩ doz $1.20
Pat. Peg, Plain Top. ₩ gr $10.00...45&10%
Pat. Peg, Leather Top. ₩ gr $12.00.45&10%

Halters.

Covert's, Rope, ¼-in. Jute..... 50&2%
Covert's, Rope, ½-in. Hemp .....50&2%
Covert's Adj. Rope Halters .....40&2%
Covert's Hemp Horse and Cattle Tie, 50&2%
Covert's Jute Horse and Cattle Ties, 60&10&2%
Covert's Adj. Web Halters .....35&2 %

Hammers—

Handled Hammers—

Maydole's, list Dec. 1, '85.. ....25&10@35%
Buffalo Hammer Co.
Humason & Beckley .....
Atha Tool Co.....
Fayette R. Plumb.....
C. Hammond & Son.....
Verree.....
Hartford, Nail Hammers...35&10@40&5%
Hartford Machinists, &c .....50@50&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75.....30&10%
Nelson Tool Works.....40&10%
Warner & Nobles.....20@25
Peck, Stow & Wilcox 40%
Sargent's.....33⅓&10%

Heavy Hammers and Sledges—

3 ℔ and under.. .... ₩ ℔ 40¢
3 to 5 ℔.....₩ ℔ 32¢
Over 5 ℔.....₩ ℔ 30¢
Wilkinson's Smiths.....10½¢@11¢₩ ℔

Handcuffs and Leg Irons—See Police Goods,

Handles—

Atkins' No. 1 Loop, ₩ pair, 28¢; No. 13¢; No. 6, 16¢; No. 2 and No. Reversible, 18¢.

Cross-Cut Saw Handles—

Boynton's Loop Saw Handles, 50¢....60%
Champion.....15%

Iron, Wrought or Cast—

Door or Thumb.

Nos..... .. 0 1 2 3
Per doz....$0.90 1.00 1.18 1.35 1.50 60&10&10%

Roggin's Latches.....₱ doz 30¢@35¢
Bronse Iron Drop Latches..₱ doz 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no Plate, $0.88 ..... net
Barn Door, ₱ doz $1.40..... 10&10%
Chest and Lifting.....70%

Wood—

Saw and Plane.....40&10@40&10&5%
Hammer, Hatchet, Axe, Sledge, &c...40%
Brad Awl.....₱ gr $2.00
Hickory Firmer Chisel, ass'd. ₱ gr 4.50
Hickory Firmer Chisel, large. ₱ gr 5.00
Apple Firmer Chisel, ass'd... ₱ gr 5.00
Apple Firmer Chisel, large... ₱ gr 6.00
Socket Firmer Chisel, ass'd... ₱ gr 3.00
Socket Framing Chisel, ass'd. ₱ gr 5.00
} dis 40%
J. S. Smith & Co.'s Pat File.....50%
File, assorted..... ₱ gr 9 75
Auger, assorted..... ₱ gr 5.00
Auger, large..... ₱ gr 7.00
} 40@ 40&10%
Pat. Auger, Ives'.....30&10%
Pat. Auger, Douglass..... ₱ set $1.25
Pat. Auger, Swan's..... ₱ set $1.00
Hoe, Rake, Shovel, &c.....50&10%

Hangers—

Barn Door, old patterns...60&10&10@70%
Barn Door, New England...60&10&10@70
Samson Steel Anti-Friction.....55%
Orleans Steel.....55%
Hamilton Wrought Wood Track.....55%
U. S. Wood Track.....65%
Champion.....60&10%
Rider and Wooster, Medina Mfg. Co.'s list.....70%
Climax Anti-Friction.....60%
Climax Anti-Friction for Wood Track55%
Zenith for Wood Track.....55%
Reed's Steel Arm.....50%
Challenge, Barn Door.....50%
Sterling's Imp'ved (Anti-Friction).65&10%
Victor, No. 1, $15.00; No. 2, $16.50, No. 3, $18.00.....50&2%
Cheritree.....50&10%
Kidder's.....50&10@60%
The Boss.....60&10%
Best Anti-Friction.....60&10%
Duplex (Wood Track).....60&10&5%
Terry's Pat., ₱ doz pr. 4 in, $10.00; 5 in. $12.00.....50&10%
Terry's Steel Anti-Friction Leader 50&10%
Terry's Steel Anti-Friction Ideal..50&10%
Coronet Patent, Steel Covered.....50&5%
Wood Track Iron Clad, ₱ ft. 10¢.....50 &15@60%
Carrier Steel Anti-Friction.....50&10%
Architect, ₱ set $6.00.....20%
Eclipse.....20&10%
Felix, ₱ set $4.50.....20%
Richards'.....30@30&10%
Lane's Standard.....50&5&50&10%
Lane's New Standard.....50@50&5%
Ball Bearing Door Hanger..20&10@25&10%
Warner's Pat.....20&10@20&10&10%
Stearns' Anti-Friction.20&10@20&10&10%
Stearns' Challenge.....25&10@25&10&10%
Faultless.....40@40&5%
American, ₱ set $6.00.....20&10%
Rider & Wooster, No. 1, 62½¢; No. 2, 75¢.....40%
Paragon, Nos. 1, 2 and 3.....40&10%
Cincinnati.....25&10%
Paragon, Nos. 5, 5¼, 7 and 8.....20&10%
Crescent.....60@60&10%
Nickel Cast Iron.....50%
Nickel, Malleable Iron and Steel 40%
Scranton Anti-Friction Single Strap33⅓%
Wild West, 4 in. Wheel, $15.00; 5 in. Wheel, $21.00.....45%
Star.....40&10@40&10&5%
May.....50&5@50&10%
Darry, $6.00.....40&10%

Harness Snaps—See Snaps.

Hatchets—

American Axe and Tool Co.
Blood's.....
Hunt's.....
Hurd's.....
Mann's.....
Peck's.....
Underhill's.....
Buffalo Hammer Co.....
Fayette R. Plumb.....
C. Hammond & Son.....
Kelly's.....
Sargent & Co.....
P., S. & W. Co.....
Ten Eyck Edge Tool Co.....
Collins.....
} 40 & 10 @ 50&5%
Schulte, Lohoff & Co.....50@50&5%

Hay and Straw Knives—See Knives.

Hinges—

Blind Hinges—

Parker.....75&2%
Palmer.....50&5&10%
Seymour.....70&2%
Huffer.....50%
Clark's, Nos. 1, 3, 5, 40 and 50 75&10&5@80%
Clark's Mortise Gravity.....50%
Sargent's, Nos. 1, 3, 5, 11, 13 75&10@55&10&5%
Sargent's, No. 12.....77&10&10%
Reading's Gravity.....75&10@75&10&5%
Shepard's Noiseless.....75&10%
Niagara.....80%
Buffalo.....80%
Clark's Genuine Pattern.....80%
O. S., Lull & Porter.....75&10%
Acme, Lull & Porter.....75%
Queen City Reversible...70&10&5@75%
Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....75&10&2½%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%

Gate Hinges—

Western.....₱ doz $4.40, 60%
N. E.....₱ doz $7.00, 55%
N. E. Reversible.....₱ doz $5.20, 55&10%
Clark's, Nos. 1, 2, 3.....60&10&5%
N. Y. State.....₱ doz $5.00, 55&10%
Automatic.....₱ doz $12.50, 50%
Common Sense.....₱ doz pair $4.50, 50%
Seymour's..... 45&10%
Shepard's.....60&10&5%
Reed's Latch and Hinges. ₱ doz $12.00, 50%

Spring Hinges—

Union Spring and Blank Butts.....40%
Gear's Spring Hinge Co.'s list, March, 1886.....30%
Acme.....30%
J. S.....25&10%
Empire and Crown.....30%
Hero and Monarch.....55%
American, Gem, and Star.....30%
Oxford.....30%
Barker's Double Acting.....25%
Union Mfg. Co.....35%
Bommer's.....30%
Buckman's.....15@20%
Chicago.....30%
Wiles'.....10%
Devore's.....40%
Rex.....40%
Royal.....60%
Reliable.....60%
Champion.....60%
Bardsley's Patent.....40%
Stearn's.....50&10%

Wrought Iron Hinges

Strap and T.....75&10%
Screw Hook and Strap { 6 to 12 in., ₱ ℔ .4 2-10¢ / 14 to 20 in., ₱ ℔ .3 7-10¢ / 22 to 36 in., ₱ ℔ .3 2-10¢
Heavy Welded Hook { 6 to 12 in., ₱ ℔ .4 2-10¢ / 14 to 20 in., ₱ ℔ .3 7-10¢ / 22 to 36 in., ₱ ℔ .3 2-10¢
Screw Hook and Eye { ½ in., ₱ doz $1.50 / ⅝ in., ₱ doz $2.45 / ¾ in., ₱ doz $3.80 } 10%
Rolled Blind Hinges, Nos. 32 and 34 50&10%
Rolled Blind Hinges, Nos. 232 and 234 55&10%
Rolled Plate.....70&10%
Rolled Raised.....70&10%
Plate Hinges "Providence" { 8, 10 & 12 in., ₱ ℔ .....5¢ / over 12 in., ₱ ℔ .....4¢

Hoes—

Eye—

D. & H. Scovil.....20%
Lane's Crescent Planters Pattern..45&5%
Lane's Razor Blade, Scovil Pattern..30%
Maynard, S. & O. Pat.....45&5%
Sandusky Tool Co.,S. & O. Pat. } 50&10&5 @60%
Am. Axe and Tool Co., S. & O. Pat. }
Chattanooga Tool Co., S. & O. Pat..60& 5@60&10%
Grub.....60&10%

Handled—

Garden, Mortar, &c.....66⅔&70%
Planter's, Cotton, &c.....66⅔&70%
Warren Hoe.....60%
Magic.....₱ doz $4.00

Hog Rings and Ringers—See Rings and Ringers.

Hoisting Apparatus—See Machines, Hoisting.

Hollow-Ware—See Ware, Hollow.

Holders.

Bag.

Sprengle's Pat.....₱ doz $18.....60%

Bit.

Extension,
Barber's, ₱ doz $15.00.....40@40&10%
Ives, ₱ doz $20.00.....60&5@60&10%
Diagonal.....₱ doz $24.00, 40%
Angular.....₱ doz $24.00, 40&5%

File and Tool—

Bals Pat.....₱ doz $4.00; 25%
Nicholson File Holders.....20%
Dick's Tool Holder.....30%

Hooks—

Cast Iron—

Bird Cage, Sargent's list.....
Bird Cage, Reading.....
Clothes Line, Sargent's list..
Clothes Line, Reading list.
} 60&10&10%
60&10@60&10&10%
Ceiling Sargent's list.....55&10&10%
Harness, Reading list..55&10@55&10&10%
Coat and Hat, Sargent's list. 55&10@60&10%
Coat and Hat, Reading.50&10@50&10&10%

Wrought Iron—

Cotton.....₱ doz $1.25
Cotton Pat. (N.Y. Mallet & Handle W'ks). 30%
Tassel and Picture (T. & S. Mfg. Co.)..50%
Wrought Staples, Hooks, &c. See Wrought Goods.

Wire—

Wire Coat and Hat, Gem, list April, 1886.....50%
Wire Coat and Hat, Miles', list April, 1886.....50%
Indestructible Coat and Hat.....45%
Wire Coat and Hat, Standard.....60%
Handy Hat and Coat.....50&10%
Steady Ceiling Hooks.....50&10%
Belt.....80&80&10%
Atlas, Coat and Hat.....60%

Miscellaneous.

Grass, No. 2, $2.00; No. 3, $2.25; No. 4, $2.50
Nolin's Grass.....₱ doz $2.25
Bush.....55@60%
Whiffletree—Patent.....55%
Hooks and Eyes—Malleable Iron. 70@70&10%
Hooks and Eyes—Brass.....60&10&10%
Fish Hooks, American.....50%
Bench Hooks.....See Bench Stops.

Horse Nails—See Nails, Horse.

Horse Shoes—See Shoes, Horse.

Hose, Rubber—

Competition.....75@75&5%
Standard.....60&10&5@60&10&10%
Extra.....40&10@60%
N. Y. B. & P. Co., Para.....25&5%
N. Y. B. & P. Co., Extra.....40@40&5%
N. Y. B. & P. Co., Dundee...50&10 @ 60%

Huskers—

Blair's Adjustable.....₱ gr $8.00
Blair's Adjustable Clipper. ..₱ gr 7.00
Hubbard's Solid Steel.....₱ gr 4.50

Indurated Fiber-Ware—See Ware, Indurated Fiber.—

Irons.

Sad—

From 4 to 10, at factory ...₱ 100 ℔, $2.30@$2.40
Self-Heating.....₱ doz $9.00 net
Self-Heating, Tailors'....₱ doz $18.00 net
Mrs. Pott's Irons.....50&5%
Enterprise Star Irons.....50&5%
Cold Handle Sad Irons.....50&5%
Ideal Irons new list.50&10@50 & 10&10%
Salamander, Irons.....25%
B. B. Sad Irons, ₱ ℔.....3 @3½¢
Combined Fluter and Sad Iron, ₱ doz, $15.00.....15%
Fox Reversible, Self-Fluter ₱ doz $24.00
Chinese Laundry (N.E. Butt Co.) 8½¢, 15%
New England.....6¢, 15%
Mahony's Troy Pol. Irons.....25%
Sensible.....20@20&5%
National Self-Heating.....30%

Soldering—

Soldering Coppers.....₱ ℔ 22 @ 23¢
Covert's Adjustable, list Jan. 1, 1886. 35&2%

Irons, Pinking, per doz., 65¢.

Jack Screws—See Screws.

Jacks, Wagon.

Daisy.....33⅓%
Victor.....33⅓%

Kettles—

	Spun.	Stamped.
Brass, 7 to 17 in., ₱ ℔....	24¢	22 ¢
Brass larger than 17 in., ₱ ℔.....	26¢	24½¢

Enameled and Tea—See Hollow-Ware.

Keys—

Lock Asso'n list Dec. 30, 1886...50&10@60&5%
Eagle, Cabinet, &c.....33⅓&2%
Hotchkiss' Brass Blanks.....40%
Hotchkiss, Copper and Tinned.....40%
Hotchkiss' Pad. and Cab.....35%
Ratchet Bed Keys.....₱ doz $4.00, 15%
Wollensak Tinned.....50&10%

Knife Sharpeners—See Sharpeners, Knife.

Knives.

Butcher, Shoe, &c—

Wilson's Butcher Knives, list Oct. 1, 1890.....25%
Ames' Butcher Knives.....25%
Foster Bros.' Butcher, &c.....40%
Nichols' Butcher Knives.....40&10%
Ames' Shoe Knives.....20@25%
Ames' Bread Knives, ₱ doz $1.50, 15@20%
Moran's Shoe and Bread.....20%
Hay and Straw.....See Hay Knives.
Table and Pocket.....See Cutlery.
Corn, Auburn Mfg. Co. Western Pat., $2.00
Corn, Auburn Mfg. Co. Crescent.....$3.50

Corn—

Bradley's.....10%
Wadsworth's.....25%

Drawing—

Witherby, P. S. & W, Mix, New Haven, Merrill.....75 @ 75&10 %
Douglas.....60&10@60&10&5%
Watrous.....75@75&5%
L. & I. J. White.....15&10@25%
Bradley's.....20&5%
Adjustable Handle.....35%
Wilkinson's Folding.....25@25&5%

Hay and Straw—

Lightning, Mfrs', price ₱ doz $18.00, 25% But jobbers cut this price freely, often selling at $8 @ $8.50.
Wadsworth's.....40@7½@40&10%
Carter's Needle.....₱ doz $11.00@$11.50
Heath's.....₱ doz $13.00@13.50
Auburn Hay, Com. and Spear Point..50%
Auburn, Straw.....40%
Nolin's Hay.....₱ doz $7.00 @ $8.00

Mincing.

Am. (3d quality), ₱ gr., 1 blade, $7; 2 blades, $12; 3 blades, $18.....net
Lothrop's.....20&10%
Smith's, ₱ doz, Single, $2.00; Double, $3 40@45%
Knapp & Cowles.....50&10@60%
Buffalo Adjustable.....₱ doz $3.00 25%
Buffalo Double Adj'table. ₱ doz $3.00 25%

Knobs—

Door Mineral.....60@65%
Door Por. Jap'd.....70@75%
Door Por. Nickel.....$2.00@2.25
Door Por. Plated, Nickel.....$2.00@2.25
Drawer, Porcelain.....60&10@60&10&10%
Hemacite Door Knobs.....40&10@50%
Yale & Towne Wood, list Dec., 1885...40%
Furniture Plain.....75¢ gro inch, 10%
Furniture, Wood Screws.....25&10%
Base, Rubber Tip.....70&10&5%
Picture, Judd's.....60&10&10@70%
Picture, Sargent's.....70&10%
Picture, Hemacite.....35&5%
Shutter, Porcelain.....65&10%
Carriage, Jap.....₱ gro 80¢, 60&10%
Bardsley's Wood Door, Shutter, &c..40%

Ladies.—

Melting, Sargent's.....	55&10%
Melting, Reading.....	35&10%
Melting, Monroe's Pat...₱ doz $4.00,	40%
Melting, P. S. & W.....	35&10@40%
Melting, Warner's.....	30%

Lanterns—

Tubular—

Plain with Guards, ₱ doz.....$4.00@4.25
Lift Wire, with Guards.....$4.50@4.75
Square Plain, with Guards.....$4.00@4.25
Sq. Lift Wire, with Guards....$4.25@4.50
Without Guards, 25¢ ₱ doz less.

Miscellaneous.

Police, Small, $6.00; Medium, $7.25; Large, $9.75.....20@25%

Lawn Mowers—See Mowers, Lawn.

Leaders, Cattle.

Humason. Beckley & Co.'s.....70%
Sargent's.....66⅔&10%
Hotchkiss.....30%
Peck, Stow & W. Co.....60&10%

Lemon Squeezers—See Squeezers, Lemon.

Lifters, Transom.

Wollensak's:
Class 3 and 4, Bronzed Iron.....50%
Class 3 and 4, Bronze Metal.....25%
Class 3 and 4, Brass.....35%
Skylight Lifters.....35%
Crown, Eagle and Shield.....50%
Reiher's, list Sept. 1, 1890.
Bronzed Iron Rods.....50&10&10&2%
Brass, Real Bronze or Nickel Plate..30%
Excelsior.....50&10&2%
Shaw's.....50&10%
Payson's:
Universal.....
Solid Grip.....
Imperial.....
} 50&10%

Lines—

Cotton and Linen Fish, Draper's.....50%
Draper's Chalk.....60%
Draper's Masons' Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25.....25%
Cotton Chalk.....50%
Samson, Cotton, No. 4, $2; No. 4½, $2.50; No. 5, $3.00.....10%
Silver Lake, Braided, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₱ gro.....35%
Mason's Linen, No. 5¾, $1.50; No. 4, $2.00; No. 4½, $2.50.
Mason's Colored Cotton.....45%

Wire Clothes.. Nos.	12	10	20
100 ft.	$4 00	$3 50	$3.00

Ventilator Cord, Samson Braided, White or Drab Cotton..₱ doz $7.50, 20%

Locks, &c.—

Cabinet—

Eagle, Gaylord Parker and Corbin... } List March, '84, rev Jan. 1, '85..33⅓&2%
Deitz, Nos. 36 to 39.....40%
Deitz, Nos. 51 to 63.....40&10%
Deitz, Nos. 86 to 96.....30%
Stoddard Lock Co.....30&33⅓%
"Champion" Night Latches.....40%
Barnes Mfg. Co.....40@40&10%
Eagle and Corbin Trunk.....25&2%
"Champion" Cab. and Combin...33⅓%
Yale.....net price
Romer's.....25%

Door Locks, Latches, &c.

R. & E. Mfg. Co., list Mar. 20, 1889. } 65&10@70 Much lower net prices often made.
Mallory, Wheeler & Co., list July, '88.
Sargent & Co., list Aug. 1, '88
Reading Hardware Co., list Feb. 2, '88.
Brittan, Graham & Mathes, list Jan. 1890.....60&10&10%
Perkins' Burglar Proof.....60&25%
Plate.....33⅓&2%
Barnes Mfg. Co.....40@40&10%
Yale.....net prices
Deits Flat Key.....30%
L. & C. Round Key Latches.....30&10%
L. & C. Flat Key Latches.....33⅓&10%
Romer's Night Latches.....15%
Shepardson or U. S.....35%
Seed's N. Y. Hasp Lock.....25%

Padlocks—

List Dec. 23, '84.....75@75&10%
Brittan, Graham & Mathes.....75&10%
Yale Lock Mfg. Co.'s.....net prices
Eagle.....25&2%
Eureka, Eagle Lock Co.....40&2%
Romer's, Nos. 0 to 91.....30%
Romer's Scandinavian, &c., Nos. 100 to 505..15%
A. E. Deits.....40%
Champon Padlocks.....40%
Hotchkiss.....30%
Star.....45%
Horseshoe.....₱ doz, $9, 40@40&10%
Barnes Mfg. Co.....40@40&10%
Nock's.....30%
Brown's Pat.....25%
Scandinavian.....90@90&10%
E. T. Fraim's Keystone Scandavian:
Nos. 110, 120, 130 and 140.....90&10%
Other Nos.....65%
Ames Sword Co. up to No. 150.....40%
Ames Sword Co. above No. 150.....50%
Slaymaker Barry & Co.
No. 41 line.....45&5%
No. 31 line.....60&5%
No. 21 line.....75@5%

Sash, &c.

Clark's, No. 1, $10; No. 2, $8 ₱ gr..33⅓%
Ferguson's.....33⅓%
Morris and Triumph, list Aug. 16, 1886, 60&2%
Victor.....60&10&2%
Walker's.....10%
Attwell Mfg. Co.....25&33⅓%
Reading.....66⅔&10@66⅔&10&10%
Hammond's Window Springs.....40%
Common Sense, Jap'd, Cop'd and Br'zed.....₱ gr $4.00
Common Sense, Nickel Plated ₱ gr $10.00
Universal.....30%
Kempshall's Gravity.....60%
Kempshall's Model.....60@60&10%
Corbin's Daisy, list Feb. 15, 1886.....70%
Payson's Perfect.....60@60&10%
Hugunin's Sash Balances.....25&5&2%
Hugunin's New Sash Locks.....25&5&2%
Stoddard "Practical".....10%
Ives' Patent.....60&10@60&10&5%
Liesche's, Nos. 100 and 110, ₱ gr $8; 105, $10.00.....20&10%
Davis, Bronze, Barnes Mfg. Co.....50%
Champion Safety, list March 1, 1888 55@55&5%
Security.....70%
Buckeye.....₱ gro $4.80

Lumber Tools—See Tools, Lumber

Lustre—

Four-ounce Bottles....₱ doz, $1.75; ₱ gross.....$17.00

Machines.

Boring—

	Without Augers.	Upright.	Angular.
Douglas.....	$5.50	$6.75	.....50%
Snell's, Rice's Pat.	5.50	6.75	40&10&10%
Jennings	5.50	6.75	45@45&10%
Other Machines...	2.35	2.75	.....
Phillips' Patent with Augers ...	7.00	7.50	....

Fluting.

Knox, 4¼-inch Rolls .....$3.25 each } 35%
Knox, 6-inch Rolls.....$3.60 each }
Eagle, 3¼-inch Roll. $2.15.....35%
Eagle, 5½-inch Roll, $2.85.....35%
Crown, 4½ in., $3.50; 6 in., $4.00; 8 in., $6.50 each.....35%
Crown Jewel, 6 in .....$3.50 each, 35%
American, 5 in., $3.00; 6 in., $3.40; 7 in., $4.50 each.....35%
Domestic Fluter.....each, $1.50
Geneva Hand Fluter, White Metal ₱ doz $12, 25%
Crown Hand Fluter, Nos. 1, $15.00; $12.50; 3, $10.00.....30%
Shepard Hand Fluter, No. 85 ₱ doz 15 30 ..... 40%

Shepard Hand Fluter, No. 110 ₱ doz 40%
$11.00
Shepard Hand Fluter, No. 95 ₱ doz 40%
$8.00
Clark's Hand Fluter. ₱ doz $15.00 35%
Combined Fluter and Sad Iron, ₱ doz $15.00 30%
₱ doz $10.00 10%
Buffalo

Hoisting—
Moore's Hand Hoist, with Lock Brake 20%
Moore's Differential Pulley Block 40%
Emery Mfg. Co's 25%

Mallets.

Hickory 20&10@20&10&10%
Lignumvitæ 20&10@20&10&10%
B. & L. Block Co., Hickory & L. V. 20@20&10%

Mattocks. Regular list 60&10%

Measures—
Standard Fiberware, No. 1, peck, ₱ dozen, $4; ½-peck, $3.50.

Meat Cutters—See Cutters, Meat.

Mills.

Coffee—
Box and Side, List Jan. 1, 1888 60&2%
American, Enterprise Mfg Co. 20&10@30%
The Swift, Lane Bros 20&10%

Mincing Knives—See Knives, Mincing.

Molasses Gates—See Gates, Molasses.

Money Drawers—See Drawers, Money.

Mowers, Lawn.

Leading makers 60@60&10&5%
Other makers 60&10&5@60&10&10%
Pennsylvania 60%
Continental 60%
New Model 60&10&5%
New Quaker City 60&10&5%
Great American 60&10&5%

Muzzles—
Safety ₱ doz, $3.00, 25%

Nails.

Cut and Wire. See Trade Report.
Wire Nails, Papered.
Association list, July 15, '89. 75@75&5%
Tack Mfrs.' list 60&10&10%
Wire Nails, Standard Penny.
Card June 1, '89, base $2.70 @ $2.75
Horse—See Trade Report.

Nos.	6	7	8	9	10
Ausable	.28¢	26¢	25¢	24¢	23¢.

40&5&2%
Clinton, Fin. .19¢ 17¢ 16¢ 15¢ 14¢ 30%
Essex .28¢ 26¢ 25¢ 24¢ 23¢.
25&10@25&10&10%
Lyra .19¢ 17¢ 16¢ 15¢ 14¢ 30%
Snowden 19¢ 17¢ 16¢ 15¢ 14¢ 30%
Putnam .23¢ 21¢ 20¢ 19¢ 18¢.
1000 ℔ in year 15%
Vulcan .23¢ 21¢ 20¢ 19¢ 18¢. 12½&2%
Northwest'n .25¢ 23¢ 22¢ 21¢ 20¢.
25@25&5%
Globe .23¢ 21¢ 20¢ 19¢ 18¢. 25&10%
Boston .23¢ 21¢ 20¢ 19¢ 18¢.
20&5&5&2½%
A. C. .25¢ 23¢ 22¢ 21¢ 21¢.
25&10@33⅓&5%
C. R.-K. .25¢ 23¢ 22¢ 21¢ 20¢.
25&10@33⅓&5%
Maud S. .25¢ 23¢ 22¢ 21¢ 21¢.
40&10&5&2%
Champlain .28¢ 26¢ 25¢ 24¢ 23¢.
25&10@25&10&10%
New Haven .28 26¢ 25¢ 24¢ 23¢.
25&10@25&10&10%
Saranac .23¢ 21¢ 20¢ 19¢ 18¢. 30&10%
Champion .25¢ 23¢ 22¢ 21¢ 20¢.
10&10&10%
Capewell .28¢ 26¢ 5¢ 24¢ 23¢.
35&5@35&10%
Star .23¢ 21¢ 19¢ 18¢.
10&10@10&12½%
Anchor .23¢ 21¢ 20¢ 19¢ 18¢ 35%
Western .23¢ 21¢ 20¢ 19¢ 18¢. 40&10%
Empire Broad 14 ₱ ℔.

Picture—
Brass Head, Sargent's list 50&10&10%
Brass Head, Combination list 50&10%
Porcelain Head, Sargent's list. 50&10&10%
Porcelain Head, Combination list. 40&10%
Niles' Patent 40%

Nail Pullers.—See Pullers, Nail.

Nail Sets.—See Sets, Nail.

Nut Crackers.—See Crackers, Nut.

Nuts—
Nuts, off list Dec. 18, 1889: Square. Hex.
Hot Pressed 5.45¢ 6.00¢
Cold Punched 5.00¢ 4.90¢
In lots less than 100 ℔, ₱ ℔, add ½¢; 1-℔ boxes, add 1¢ to list.

Oakum—

Government ₱ ℔ 7@7¼¢
U. S. Navy ₱ ℔ @6½¢
Navy ₱ ℔ 5¼@5½¢

Oilers—
Zinc and Tin 65&10@70%
Brass and Copper 50&10@50&10&5%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4.00; No. 3, $4.40 ₱ doz. 10@10&5%
Malleable, Hammers, Old Pattern, same list 40%
Prior's Pat. or "Paragon" Zinc, 60&10&10%
Prior's Pat. or "Paragon" Brass 50%
Olmstead's Tin and Zinc 60%
Olmstead's Brass and Copper 50%
Broughton's Zinc 60%
Broughton's Brass 50%
Gem P. D. & Co. ₱ gro. $2
Steel, Draper and Williams 50%

Openers, Can.
Messenger's Comet ₱ doz $3.00, 25%
American ₱ gross $5.00
Duplex doz 25¢, 15@20%
Lyman's ₱ doz $3.75, 30%
No. 4 French ₱ doz $2.25, 55@60%
No. 5, Iron Handle ₱ gr $6.00, 45@50%
Eureka ₱ doz $2.50, 10%
Sardine Scissors ₱ doz $2 75@3.00
Star ₱ doz $2.75
Sprague, No 1, $2.00 2, $2.25; 3, $2.50 50&10&10%
Excelsior, No 1, $2.50; No. 2, $1.50 40%
World's Best, ₱ gross, No. 1, $12.00; No. 2, $24.00; No. 3, $36.00 60&10%
Universal, ₱ doz $3.00 60&5%
Domestic, ₱ doz $2.50 40%
Champion ₱ doz $2.00 50%

Packing, Steam—

Rubber—
Standard 60&5@65%
Extra 50@50&5%
N. Y. B. & P. Co., Standard 40&10@50%
N. Y. B. & P. Co., Empire 50&5@65%
N. Y. B. & P. Co., Salamander, ₱ ℔ 65¢, 10@15%
Jenkins' Standard. ₱ ℔ 80¢ 25@25&5%

Miscellaneous—
American Packing 10¢@11¢ ₱ ℔
Russia Packing 14¢ ₱ ℔
Italian Packing 13¢@14¢ ₱ ℔
Cotton Packing 15¢@17¢ ₱ ℔
Jute 7¢@8¢ ₱ ℔

Padlocks—See Locks.

Pails.

Galvanized Iron—

	Quarts	10	12	14
Hill's Light Weight, ₱ doz.	$2.75	3.00	3.25	
Hill's Heavy Weight, ₱ dz.	3.00	3.25	3.75	
Helwig's	2.75	3.00	3.25	
Sidney Shepard & Co.	2.35	2.85	3.05	
Iron Clad	2.50	2.75	3.00	
Fire Buckets	2.75	3.25	3.50	

Buckets, see Well Buckets.
Indurated Fibre Ware—25%
Star Pails, 12 qt ₱ doz $6.00
Fire, Stable and Milk, 14 qt ₱ doz $7.80
Standard Fibre Ware—

	Plain.	Decr'd
Water Pails, 12 qt., per doz.	$4.00	$4.50
Dairy Pails, 14 qt., per doz.	4.50	5.00
Fire Pails, No. 1, 12 qt. per doz	4.50	
Fire Pails, No. 2, 14 qt. per doz	5.00	
Sugar Pails	6.00	6.50
Horse Pails	5.00	
Buggy Pails	4.00	
Slop Jars (bal. trap)	8.00	9.00
Chamber Pails, 14-qt	6.50	7.50

Pans.

Dripping.
Small sizes ₱ ℔ 6¼¢
Large sizes ₱ ℔ 5½¢
Silver & Co. (Covered) 40%

Fry—
Standard List:

No.	0	1	2	3	4
₱ doz.	$3.00	$3.75	$4.25	$4.75	$5.25
No.		5	6	7	8
₱ doz.		$6.00	$7.00	$8.00	$9.00

Polished, regular goods 70&10%
Acme Fry Pans 60&10%

Paper and Cloth—

Sand and Emery—
List April 19, 1886 50@50&10%
Sibley's Emery and Crocus Cloth 30%

Parers.

Apple.
Advance ₱ doz $4.75
Baldwin ₱ doz 5.25
Bonanza each 5.00
Champion ₱ doz 7.25
Daisy ₱ doz 4.00
Dandy each 7.50
Eureka, 1888 each 16.00
Family Bay State ₱ doz 12.00
Favorite ₱ doz 5.00
Gem ₱ doz 5.25
Gold Medal ₱ doz 4.00
Ideal ₱ doz 4.00
Improved Bay State ₱ doz 27.00 @ 30.00
Little Star ₱ doz 4.50
Monarch ₱ doz 13.50
New Lightning ₱ doz 5.50
Oriole ₱ doz 4.00
Penn ₱ doz 4.00
Perfection ₱ doz 4.00
Pomona ₱ doz 4.00
Rocking Table ₱ doz 6.00
Turntable ₱ doz 4.50
Victor ₱ doz 13.50
Waverly ₱ doz 4.00
White Mountain ₱ doz 4.00
73 ₱ doz 4.25
76 ₱ doz 5.75
78 ₱ doz. 6.50

Potato—
White Mountain ₱ doz $4.50
Antrim Combination ₱ doz $5.50
Hoosier ₱ doz $13.50
Saratoga ₱ doz $5.50

Pencils—
Faber's Carpenters' high list 50%
Faber's Round Glit ₱ gro $5.25
Dixon's Lead ₱ gro $4.50
Dixon's Lumber ₱ gro $6.75
Dixon's Carpenters' 40&10%

Picks—
Railroad or Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00 60&10%

Picture Nails.—See Nails, Picture.

Pinking Irons.—See Irons, Pinking.

Pins.

Bow—
Humason, Beckley & Co.'s 60&10%
Sargent & Co's. $17 and $18 60&10%
Peck, Stow & W. Co. 50&10&50&10&5%

Curtain—
Silvered Glass net
White Enamel net

Escutcheon,
Iron, list Nov. 11, 1885. 50&10@50&10&5%
Brass 60@60&5%

Pipe, Wrought Iron—
List September 18, 1889.
1¼ and under, Plain 47½%
1¼ and under, Galvanized 40%
1½ and over, Plain 60%
1½ and over, Galvanized 47½%
Boiler Tubes, Iron.
1¾ and under 45%
2 to 4 inch 50%
4-inch and larger 52½%

Planes and Plane Irons—

Wood Planes—
Molding 35&2%
Bench, First Quality 50&2%
Bench, Second Quality 55&2%
Bailey's (Stanley R. & L. Co.). 40&10%

Iron Planes—
Bailey's (Stanley R. & L. Co.) 40&10@40&10&10%
Miscellaneous Planes (Stanley R. & L. Co.) 20&10@20&10&10%
Victor Planes (Stanley R. & L. Co.) 20&10@20&10&10%
Steer's Iron Planes 35@35&10%
Merriden Mal. Iron Co.'s 40@40&10%
Davis's Iron Planes 40@40&10%
Birmingham Plane Co. 50@50&10%
Gage Tool Co.'s Self-Setting 20&10&10%
Chaplin's Iron Planes 40@40&10%
Saranac's 30&10@30&10&10%
Standard Tool Co. 50@50&5%

Plane Irons—
Butcher's $5.00@$5.25 to 2
Buck Bros 30%
Auburn "Thistle" } 35&2%
Ohio }
Sandusky }
S. & I. J. White 25%

Plates.

Felloe ₱ ℔ 6¢@6½¢

Pliers and Nippers—
Button's Patent 50&50&10%
Hall's No. 2, 5 in., $13.50; No. 4, 7 in. $21.00 ₱ doz 20&10@33⅓%
Humason & Beckley Mfg. Co. 50@50&10%
Gas Pliers 60%
Gas Pliers, Custar's Nickel Plated. 60&5%
Eureka Pliers and Nippers 40%
Russell's Parallel 25%
P. S. & W. Cast Steel 50%
P. S. & W. Tinners' Cutting Nippers, add 6% dis 10%
Carew's Pat. Wire Cutters 20%
Morrill's Parallel, ₱ doz, $12.00 30&5%
Cronk's 6 in., $15.00; 10 in. $21.00, 40@40&5%

Plumbs and Levels—
Regular List 70&10@70&10&10%
Disston's 50%
Pocket Levels 70&10@70&10&10%
Davis Iron Levels 30%
Davis' Inclinometers 10&10%

Poachers.

Egg.
Buffalo Steam Egg Poachers, ₱ doz, No. 1, $6.00; No. 2, $9.00 25%
Silver & Co., 6-Ring.. ₱ doz $4; 3-Ring $2

Pokes, Animal—
Bishop's I. X. L. ₱ doz $6.00
Bishop's O. K. ₱ doz $5.25
Bishop's Pioneer ₱ doz $3.75
Bishop's American ₱ doz $2.75
Eagle, Double Stale ₱ doz $5.75
Eagle, Single Stale ₱ doz $3.75
Buckeye, Single Stale ₱ doz $2.75

Police Goods.
R. I. Tool Co., Handcuffs, $15.00 ₱ doz 10%
R. I. Tool Co., Leg Irons, $25.00 ₱ doz 10%
Tower's 25%
Daley's Improved Handcuffs: 2 Hands, Polished, ₱ doz $48.00; Nickeled, $57.00; 3 Hands, Polished, ₱ doz $72.00; Nickeled, $84.00 25%
J. P. Lovell's Police Goods 25%

Polish, Metal.
Prestoline 30%
Prestoline Paste 33⅓%
Gaston's Silver Compound 33⅓%

Polish, Stove.
Joseph Dixon's ₱ gro $6.00, 10%
Gem ₱ gro $4.50, 10%
Gold Medal ₱ gro $6.00, 25%
Mirror ₱ pro $6.00, —%
Lustro ₱ gro $4.75
Ruby ₱ gro $5.75
Rising Sun, 5 gro lots ₱ gro $5.50
Dixon's Plumbago ₱ ℔ 5¢
Boynton's Noon Day, ₱ gro 13.00
Parlor Pride Stove Enamel. ₱ gro
Yates' Liquid, 2 3 5 10 gal.
₱ gal ...$0.80 .70 .60 .50
Yates Standard Paste Polish, 10-℔ cans, ₱ ℔ 12½¢
Jet Black ₱ gro $3.50
Japanese ₱ gro $3.50
Fireside ₱ gro $2.50
Diamond O. K. Enamel ₱ gro $19.00
Bonnell's Liquid Stove Polish ₱ gro $9.00
Bonnell's Paste Stove Polish. ₱ gro $6.00
Black Eagle Benzine Paste, 5 and 10 ℔ cans 12½¢
Black Jack Water Paste, 5 and 10 ℔ cans 12½¢
Nickel Plate Paste ₱ gro $6.00

Peppers, Corn—
Round or Square, 1 qt. ₱ gr $10.00@10.50
Round or Square, 1½ qt. ₱ gr $15@15.50
Round or Square, 2 qt. ₱ gr $18.50@19.00

Post Hole and Tree Augers and Diggers—See Diggers, Post Hole, &c.

Potato Parers—See Parers, Potato.

Pots.

Glue—
Tinned 40%
Enameled 40&5%
Family, Howe's "Eureka" 40%
Family, L. F. C.'s "Handy" 50%

Presses.

Fruit and Jelly—
Enterprise Mfg. Co. 20&10@30%
Henis ₱ doz $3.50
Shepard's Queen City 40%
Silver & Co. ₱ doz $2.75

Pruning Hooks and Shears.—See Shears.

Pullers.

Nail.
Curtiss Hammer ₱ doz $9.00
Giant, No. 1 ₱ doz. $13.00, 10%
Giant, No. 2 ₱ doz, $15.00, 10%
Pelican ₱ doz, $9.00, 25%

Pulleys—
Hot House, Awning, &c. 60&10%
Japanned Screw 60&10%
Brass Screw 60&10%
Japanned Side 66⅔&10%
Japanned Clothes Line 60&10%
Empire Sash Pulley 55@60%
Moore's Sash, Anti-Friction 50%
Hay Fork, Solid Eye, $4.00; Swivel, $4.50 50&10@50&10&5%
Hay Fork, "Anti-Friction," 5 in. Solid, $5.70 50%
Hay Fork, "F" Common and Pat. Bushed 20%
Hay Fork, Tarbox Pat. Iron 20%
Hay Fork, Reed's Self-Lubricating 60%
Shade Rack 45%
Tackle Blocks. See Blocks
Moore's Anti-Friction 5 in. Wheel, ₱ doz $12.00 40%

Pumps—
Cistern, Best Makers 60@60&10%
Pitcher Spout, Best Makers 67½@70%
Pitcher Spout, Cheaper Goods. 70@70&5%

Punches—
Saddlers' or Drive, good, ₱ doz 60@65¢
Bemis & Call Co.'s Cast Steel Drive. 50&5%
Bemis & Call Co's Springfield Socket. 50&5%
Spring, good quality ₱ doz $2.50@2.60
Spring, Leach's Pat. 15%
Bemis & Call Co.'s Spring and Check 40%
Solid Tinners', P. S. & W. Co., ₱ doz $1.44, 55%
Tin'rs' Hollow Punches P. S. & W. Co. 20&2%
Rice Hand Punches 15%
Avery's Revolving 40%
Avery's Saw-Set and Punch. See Saw Sets.

Rail—

Sliding Door, Wr't Brass, ₱ ℔ 35¢ 15%
Sliding Door, Bronzed Wr't Iron. ₱ ft. 7¢
Sliding Door, Iron, Painted, ₱ foot 4¢, 40%
Barn Door Light. In. ½ ¾ ¾
Per 100 feet $2.00 2.50 3.10, 10%
B. D. for N. E. Hangers—

	Small.	Med.	Large.
Per 100 feet	$2.15	2.70	3.25, net

Terry's Steel Rail, ₱ foot 4½¢
Victor Track Rail, 7¢ ₱ foot 50&3%
Carrier Steel Rail, ₱ foot 4½¢
Moore's Wrought Iron 25%

Rakes—
Cast Steel, Association goods 66⅔@70%
Cast Steel, outside goods 60&10&10@70&5%
Malleable 70@70&5%
Gibbs Lawn Rake $12.00, 50&15%
Canton Lawn Rake $9.00, 50&10
Ft. Madison Prize Bow Brace and Peerless 65%
Fort Madison Steel Tooth Lawn Rake, $6.00 25%

Razors—
J. R. Torrey Razor Co 20%
Wostenholme and Butcher, $10.00 to $2. 10%
Jordan's AAA1, list Nov. 1, 1889 50%
Jordan's Old Faithful, list Nov. 1, '89. 50%
Electric List net

Razor Strops—See Strops, Razor.

Rings and Ringers.

Bull Rings—
Union Nut Co. 55%
Sargent's 66⅔&10@70&5%
Hotchkiss' low list 30%
Humason, Beckley & Co.'s 70&10%
Peck, Stow & W. Co's. 50&10@50&10&10%
Eilrich Hdw. Co., White Metal, low list. 50@50&10%

Hog—
Top of the Hill Ringers. ₱ doz $2.00
Top of the Hill Rings. ₱ doz $1.25
Hill's Improved Ringers ₱ doz $1.25
Hill's Old Style Ringers. ₱ doz $1.12½
Hill's Tongs. ₱ doz $3.00
Hill's Rings. ₱ doz bxs $1.00
Perfect Rings. ₱ doz bxs $1.50
Perfect Ringers. ₱ doz $2.15@$2.25
Blair's Hog Ringers. ₱ doz $2.00
Blair's Hog Rings. ₱ doz 90¢@$1.00
Champion Ringers. ₱ doz $2.00
Champion Rings, Double. ₱ doz $2.25
Brown's Ringers. ₱ doz $2.00
Brown's Rings. ₱ doz $1.15@1.25

Rivet Sets—See Sets, Rivet.

Rods—
Stair, Brass 25&2%
Stair, Black Walnut ₱ doz 40¢

Rollers—
Barn Door, Sargent's list 60&10&10%
Acme Moore's Anti-Friction 55%
Union Barn Door Roller 70%

Rope—
Manila, ½ in. and larger ₱ ℔ 14½¢
Manila ⅜ in. ₱ ℔ 15 ¢
Manila ¼ and 5-16 in. ₱ ℔ 16½¢
Manila Tarred Rope ₱ ℔ 14 ¢
Manila, Hay Rope ℔ 14½¢
Sisal ½ inch and larger ₱ ℔ 9½¢
Sisal ⅜ in. ₱ ℔ 10½¢
Sisal ¼ and 5-16 in. ₱ ℔ 10½¢
Sisal, Hay Rope ₱ ℔ 9½¢
Sisal, Tarred Rope ₱ ℔ 9½¢
Sisal, Medium Lathe Yarn ₱ ℔ 8½¢
New Zealand ½ in. and larger ₱ ℔ 8½¢
New Zealand ⅜ inch, ₱ ℔ 10½¢
New Zealand, ¼ and 5-16 inch, ₱ ℔ 9½¢
New Zealand, Hay Rope ₱ ℔ 8½¢
New Zealand, Tarred Rope ₱ ℔ 8½¢
Note.—Manufacturers' prices on above ½¢ ₱ ℔ less.
Cotton Rope ₱ ℔ 15@18¢ net
Jute Rope ₱ ℔ 7½¢

Wire—
List May 1, 1886.
Iron 32½&2½%
Iron, Galvanized 40&2½%
Cast Steel 40&2½%

Rules—
Boxwood 80&10&10@80&10&10&10%
Ivory 50@50&10%
Starrett's Rules and Straight Edges, Steel 25&10%

Sad Irons—See Irons, Sad.

Sand and Emery Paper and Cloth—See Paper and Cloth, Sand and Emery.

Sash Cord—See Cord, Sash.

Sash Locks—See Locks, Sash.

Sash Weights—See Weights, Sash.

Sausage Stuffers or Fillers—See Stuffers or Fillers, Sausage.

Saws—
Disston's Circular 45%
Disston's Cross Cuts 45%
Disston's Hand 20%
Woodrough & McFarlin.
Hand, Panel and Rip 25%
Narrow Champion Cross Cuts with Handles, ₱ foot 20¢
Champion Thin Back Cross Cuts, ₱ foot 28¢
Champion Extra Thin Back Cross Cuts, ₱ foot 31¢
One Man Champion Cross Cuts, ₱ foot 40¢
Wheeler, Madden & Clemson Mfg. Co.
Hand, Panel and Rip 30%
Narrow Champion Cross Cuts with Handles, ₱ foot 20¢
Champion Thin Back Cross Cuts, ₱ foot 28¢
Champion Extra Thin Back Cross Cuts, ₱ foot 31¢
One Man Champion Cross Cuts, ₱ ft. 40¢

Atkins' Circular Shingle and Heading dis 50%
Atkins' Silver Steel Diamond X Cuts ₱ foot 70¢
Atkins' Special Steel Dexter X Cuts ₱ foot 50¢
Atkins' Special Steel Diamond X Cuts ₱ foot 32¢
Atkins' Champion and Electric Tooth X Cuts ₱ foot 30¢
Atkins' Hollow Back X Cuts. ₱ foot 20¢
Atkins' Mulay, Mill and Drag.....40%
Atkins' One-Man Saw, with handles ₱ foot 40¢
Peace Circular and Mill.....45%
Peace Hand Panel and Rip.....25%
Peace Cross Cuts.....45%
Richardson's Circular and Mill.....45%
Richardson's X Cuts.....45%
Richardson's Hand. &c.....25%
C. E. Jennings & Co., Hand, Panel and Rip.....25%

Hack Saws—

Griffin's, complete.....40&10@50%
Griffin's Hack Saw, Blades....40&10@50%
Star Hack Saws and Blades.....25%
Eureka and Crescent.....25%

Scroll—

Lester, complete, $10.00.....25%
Rogers, complete, $4.00.....25%
Barnes' Builders' and Cabinet Makers', $15.....25%
Barnes' Scroll Saw Blades.....35%

Saw Frames—See Frames, Saw.

Saw Sets—See Sets, Saw.

Saw Tools—See Tools, Saw.

Scales—

Hatch, Counter, No. 171, good quality, ₱ doz $21.00
Hatch, Tea, No. 161....₱ doz $6.75@$7.00
Union Platform, Plain.....$2.10@2.20
Union Platform, Striped.....$2.20@2.30
Chatillon's Grocers' Trip Scales.....50%
Chatillon's Eureka.....25%
Chatillon's Favorite.....40%
Family, Turnbulls.....30@30&10%
Richie Bros.' Platform.....40%

Scale Beams—See Beams, Scale

Scissors, Fluting.....45%

Scrapers—

Adjustable Box Scraper (S. R. & L. Co.) $6.50.....30&10%
Box, 1 Handle.....₱ doz $4.00. 10%
Box, 2 Handle.....₱ doz $6.00. 10%
Defiance Box and Ship.....20&10%
Foot.....50&10@5%
Ship, Common.....₱ doz $3.50 net
Ship, R. I. Tool Co.....10%

Screen Window and Door Frames—See Frames.

Screw Drivers—See Drivers, Screw.

Screws.

Bench and Hand—

Bench, Iron.....55&10@55&10&10%
Bench, Wood, Beech.....₱ doz $2.25
Bench, Wood, Hickory.....20&10%
Hand, Wood.....25&10@25&10&5%
Lag, Blunt Point, list Jan. 1, 1890.75&10%
Coach and Lag, Gimlet Point, list Jan. 1, 1890.....75@75&10%
Bed.....25&5%
Hand Rail, Sargent's.....66⅔&10%
Hand Rail, H. & B. Mfg. Co...70&10@75%
Hand Rail, Am. Screw Co.....75%
Jack Screws, Millers Falls list..60@50&5%
Jack Screws, P. S. & W.....35%
Jack Screws, Sargent...60&10@60&10&5%
Jack Screws Stearns'.....40@40&10%

Cork—

Humason & Beckley Mfg. Co..40&10@50%
Williamson's.....33⅓@33⅓&5%
Howe Bros & Hulbert.....30%

Machine—

Flat Head, Iron.....55%
Round Head, Iron.....50%

Wood—

List March 1, 1889.

Flat Head Iron.....50%	Extra 10 @ 10&5 % often given
Round Head Iron.....40%	
Flat Head Brass.....45%	
Round Head Brass.....35%	
Flat Head Bronze.....45%	
Round Head Bronze..35%	

Rogers' Drive Screws.....66⅔%

Scroll Saws—See Saws, Scroll.

Scythe Snaths—See Snaths, Scythe.

Sets.

Awl and Tool.

Aiken's Sets, Awls and Tools, No. 20, ₱ doz $10.00.....55&10%
Fray's Adj. Tool Hdls., Nos. 1, ½2, 2, 3, $12; 4, $9.....25@25&10%
Miller's Falls Adj. Tool Hdls., Nos. 1, $12, 2, $18.....25%
Henry's Combination Haft...₱ doz $6.50
Brad Sets, No. 42, $10.50; No. 43, $12.50..70&10&5%
Stanley's Excelsior: No. 1, $7.50; No. 2, $4.00; No. 3, $5.50.....30&10%

Nail—

Square.....₱ gr., $4.00@$4.25
Round.....₱ gr. $3.25
Buck Bros.....27½%
Cannon's Diamond Point...₱ gr., $12, 20%

Rivet.

Regular list.....50&10%

Saw—

Stillman's Genuine...₱ doz $5.00@7.75, 40&5%
Stillman's Imita.....₱ doz $3.25@5.25, 40&5@40&10%
Common Lever.....₱ doz $2.00, 40&5%
Morrill's No. 1, $15.00; Nos. 3&4, $24.00. 40&10@50%
Leach's...No. 0, $8.00; No. 1, $15, 15&20%
Nash's.....20&10@20&10&10%
Hammer, Hotchkiss.....$5.50, 10%
Hammer, Bemis & Call Co.'s new Pat. 30&5%
Bemis & Call Co.'s Lever and Spring Hammer.....30&5%
Bemis & Call Co.'s Plate.....10%
Bemis & Call Co.'s Cross Cut.....12½%
Aiken's Genuine.....$13.00, 50&10%
Aiken's Imitation.....$7.00, 55&5%
Hart's Pat. Lever.....20%
Diston's Star.....25%
Leopold.....40&10& 5%
Atkin's Lever.....₱ doz No. 1, $6.00
Atkin's Criterion.....₱ doz No. 1, $6.00
Croissant (Keller), No. 1, $15.00; No. 2, $24.00.....40&10%
Avery's Saw Set and Punch.....50%
Chieftain H. R. Co.'s Superior.....₱ doz $15, 50%

Sharpeners, Knife.

Parkin s.
Applewood Handles...₱ doz $6.00, 40%
Rosewood or Cocobolo.₱ doz $9.00, 40%

Shaves, Spoke.

Iron.....45%
Wood.....30%
Bailey's (Stanley R. & L. Co.).....40&10%
Stearns'.....30&10%
Cincinnati.....25&10%

Shears—

American (Cast) Iron...75&10@75&10&5%
Barnard's Lamp Trimmers...₱ doz $3.75
Tinners'.....20&2%
Seymour's, List, Dec., 1881. 60&10&10@60&10&10&5%
Heinisch's, List, Dec., 1881. 60&10&10@60&10&10&5%
Heinisch's Tailor's Shears.....33⅓%
First quality C. S. Trimmers..80@80&10%
Second quality C. S. Trimmers. 80&10@80&10&10%
Acme Cast Shears.....10&10%
Diamond Cast Shears.....10%
Clipper.....10&10%
Victor Cast Shears.....75&10@75&10&5%
Howe Bros. & Hulbert, Solid Forged Steel.....40%
Chicago Drop Forge & F. Co., Solid Steel Forged.....60%
Clauss Shear Co., Japanned.....70%
Clauss Shear Co., Nickeled, same list. 60%
Electric.....List net

Pruning Shears and Hooks.

Diston's Combined Pruning Hook and Saw.....₱ doz $18.00, 20&10%
Diston's Pruning Hook, ₱ doz $12.00, 20&10%
E. S. Lee & Co.'s Pruning Tools.....40%
Pruning Shears, Henry's Pat, ₱ doz $3.75@4.00 net
Henry's Pruning Shears, ₱ doz $4.25@ 4.50 net
Wheeler, M. & C. Co.'s Combination, ₱ doz $12.00, 20%
Dunlap's Saw and Chisel, ₱ doz $5.50, 30%
J. Mallinson & Co., No. 1, $5.25; No. 2 7.25
P., S. & W. Co.....60%

Tinners', &c.—

Shears and Snips (P. S. & W.).....20@25%
Snips, J. Mallinson & Co.....33⅓%

Sheaves—

Sliding Door—

M. W. Co., list July, 1888..50&10@60&5%
R. & E., list Dec. 18, 1885.....55&20%
Corbin's list.....60&10&2%
Patent Roller.....60&10&2%
Patent Roller, Hatfield's.....75%
Russell's Anti-Friction, list Dec. 18, 1885.....60&2%
Moore's Anti-Friction.....50%

Sliding Shutter—

R. & E. list Dec. 18, 1885.....60&10&2%
Sargent's list.....60&10%
Reading list.....60&10&10%

Ship Tools—

L. & I. J. White.....20&5%

Shoes, Horse, Mule, &c.—

Horse—

Burden's, Perkins', Phœnix, at factory. $4.00

Mule—

Add $1 ₱ keg to above prices.

Ox, Wrought—

Ton lots.....₱ ₺ 9¢
1000 ₺ lots.....₱ ₺ 9½¢
500 ₺ lots.....₱ ₺ 10¢

Shot—

(Eastern prices 2¢ off, cash, 5 days.

Drop, ₱ bag, 25 ₺.....$1.62
Drop, ₱ bag, 5 ₺.....38
Buck and Chilled, ₱ 25-₺ bag.....1.87
Buck and Chilled, ₱ 5-₺ bag.....43

Shovels and Spades—

Ames' Shovels, Spades, &c., list Nov. 1, 1885.....20%
NOTE.—Jobbers frequently give 5@7½% extra on above.
Griffith's Black Iron.....50&10%
Griffith's C. S.....60@60&10%
Griffith's Solid C. S. R. R. Goods.....20%
Old Colony (Sanford Fork & Tool Co).35%
St. Louis Shovel Co.....20@20&7½%
Hussey, Binns & Co.....15@25%
Hubbard & Co.....20@20&7½%
Lehigh Mfg. Co.....50&10%
Payne Pettebone & Son, list January 1890.....30%
Remington's (Lowman's Pat.)30&10@40%
Rowland's, Black Iron.....50&10%
Rowland's Steel.....60&5@60&10%

Shovels and Tongs—

Iron Head.....60&10@60&10&5%
Brass Head.....60&10&10%

Sieves—

Mann's Tin Rim.....50&25%
Buffalo Metallic, S. S. & Co.....50&25%
Shaker (Barler's Pat.) Flour Sifters.....₱ doz $3.00; ₱ gr $21.00
Electric.....₱ gr $21.00
A. & W. Sifters.....₱ doz 2.00
Hunter's.....₱ doz $2.00
Smith's Adjustable Sifters....₱ doz $2.00
Smith's Adjustable Milk Strainer. ₱ doz $2.00
Smith's Adjustable T. & C. Strainer. ₱ doz. $1.25

Sieves, Wooden Rim—

	Iron.	Plated.
Mesh 18, Nested, ₱ doz..	80¢	$1.00
Mesh 20, Nested, ₱ doz..	95¢	1.10
Mesh 24, Nested, ₱ doz..	$1.15	1.25

Skeins, Thimble—

Western list.....75&5@75&10%
Columbus Wrt. Steel. Special net prices
Coldbrookdale Iron Co.....60%
Utica P. S. T. Skeins.....60%
Utica Turned and Fitted.....35%

Slates—

School, by case.....50&10@50&10&10%

Snaps, Harness, &c.—

Anchor (T. & S. Mfg. Co.).....65%
Fitch's (Bristol).....50&10%
Hotchkiss.....10%
Andrews.....50%
Sargent's Patent Guarded.....70&10&10%
German, new list.....40&10%
Covert.....50&2%
Covert, New Patent.....50&5&2%
Covert, New R. E.....60&2%
Covered Spring.....60&10&10%

Snaths, Scythe.

List.....50&10@50&10&5%

Soldering Irons—See Irons, Soldering.

Spittoons, Cuspidors, &c.

Standard Fiberware—

Cuspidors, 8¼-inch, ₱ doz., No. 5, $8; No. 5X $9.
Spittoons, Daisy, 8-inch, No. 1, $4; 10 and 11 inch, $6.

Spoke Shaves—See Shaves, Spoke.

Spoke Trimmers—See Trimmers, Spoke.

Spoons and Forks—

Tinned Iron—

Basting, Cen. Stamp. Co.'s list....70&10%
Solid Table and Tea, Cen. Stamp. Co.'s list.....70&10%
Buffalo S. S. & Co.....33⅓&2%

Silver-Plated—(4 mos. or 5% cash 30 days).

Meriden Brit. Co., Rogers.....40&15%
C. Rogers & Bros.....40&15%
Rogers & Bro.....40&15%
Reed & Barton.....40@40&2%
Wm. Rogers Mfg. Co.....40, 15&5%
Simpson, Hall, Miller & Co.....40, 15&5%
Holmes & Edwards Silver Co...40, 15&5%
L. Boardman & Son.....50&12½%

Miscellaneous.

Holmes & Edwards Silver Co.:
No. 67 Mexican Silver.....50&10&5%
No. 30 Silver Metal.....50&10&5%
No. 24 German Silver.....50&10&5%
No. 50 Nickel Silver.....50&5%
No. 49 Nickel Silver.....50&10&5%
Wm. Rogers Mfg. Co.
Rogers' Silver Metal.....50, 10&5%
18% Rogers' German Silver.....60&5%
22% Rogers' Nickel Silver.....50&5%
German Silver.....50@50&5
German Silver, Hall & Elton..50&5% cash
Nickel Silver.....50&5@50&10&5% cash
Britannia.....60%
Boardman's N'ck'l Silver.40&7½&5% cash
Boardman's Britannia Spoons, case lots.....50&12½&5% cash

Springs—

Door.—

Torrey's Rod, regular size....₱ doz $1.80
Gray's, ₱ gr., $20.00.....20%
Bee Rod ₱ gr., $20.00.....20%
Warner's No. 1, ₱ doz, $2.50; No. 2, $3.30.....40&10@50%
Gem (Coil), list April 19, 1886.....10%
Star (Coil), list April 19, 1886.....20%
Victor (Coil).....60@60&10%
Champion (Coil).....60&10@60&10&10%
Philadelphia, 5 in., $5.00; 8 in., $7.75..
Cowell's....No. 1, ₱ doz, $18.00; No. 2, $15.00.....50%
Rubber, complete, ₱ doz, $4.50...55&10%
Hercules.....50%
Shaw Door Check and Spring.25@30@35%

Carriage, Wagon, &c.—

Elliptic, Concord, Platform and Half Scroll.....60&10&10%
Cliff's Bolster Springs.....25%

Squares—

Steel and Iron.....
Nickel-Plated.....} .....80 &10&10%
Try Square and T Bevels...60&10@60&10&10%
Disston's Try Square and T Bevels.....50%
Winterbottom's Try and Miter....30&10%
Starrett's Micrometer Caliper Squares. 25%
Avery's Flush Bevel Squares.....40%
Avery's Bevel Protractor.....50%

Squeezers.

Fodder.—

Blair's.....₱ doz $2.00
Blair's "Climax".....₱ doz $1.25

Lemon—

Porcelain Lined, No. 1....₱ doz $6.00, 25&30%
Wood, No. 2.....₱ doz $3.00, 35%
Wood, Common.....₱ doz $1.70@1.75
Dunlap's Improved.....₱ doz $3.75, 20%
Sammis....No. 1, $5.00; No. 2, $9; 12, $18 ₱ doz.....25&10%
Jennings' Star.....₱ doz $2.50
The Boss.....₱ doz $2.50
Dean's...Nos. 1, ₱ doz $6.50; 2, $3.35; 3, $1.90; Queen, $2.50
Little Giant.....50@50&5%
King.....40&5%
Hotchkiss Straight Flash...₱ doz $12.00
Silver & Co., Glass.....₱ gro. $9.00

Standard Fiber Ware—See Ware, Standard Fiber.

Staples.

Blind—

Barbed, ½ in. and larger.....₱ ₺ 7@7½¢
Barbed, ⅝ in.....₱ ₺ 8@8½¢
Fence Staples, Galvanized. } Same price as BrbWire. See Trd.Rep.
Fence Staples, Plain.....}

Steelyards.....40&10@50%

Stocks and Dies—

Blacksmith's
Waterford Goods.....40@40&10%
Butterfield's Goods.....40@40&10%
Lightning Screw Plate.....25@30%
Reece's New Screw Plates....33⅓&5@40%
Reversible Ratchet.....30%
Gardner.....35%

Stops, Bench.

Morrill's.....₱ doz $9, 50%
Hotchkiss's.....₱ doz $5, 10@10&10%
Weston's, No. 1, $10; No. 2, $9.25&10&5%
McGill's.....₱ doz $3.....10%
Cincinnati.....25&10%

Stone—

Hindostan No. 1, 3¢; Axe, 3½¢; Slips No. 1, 4½¢
Sand Stone.....₱ ₺ 2½¢
Washita Stone, Extra.....₱ ₺ 20@21¢
Washita Stone, No. 1.....₱ ₺ 15&16¢
Washita Stone, No. 2.....₱ ₺ 11&12¢
Washita Slips, No. 1, Extra..₱ ₺ 37@40¢
Washita Slips, No. 1.....₱ ₺ 25&26¢
Arkansas Stone, No. 1, 4 to 6 in.₱ ₺ $1.50
Arkansas Stone, No. 1, 6 to 9 in.₱ ₺ $1.85
Turkey Oil Stone, 4 to 8 in.....₱ ₺ 40¢
Turkey Slips.....₱ ₺ $1.00@1.50
Lake Superior, Chase.....₱ ₺ 16¢
Lake Superior Slips, Chase...₱ ₺ 31@32¢
Seneca Stone, Red Paper Brand...₱ ₺ 18@20¢
Seneca Stone, High Rounds..₱ ₺ 20@25¢
Seneca Stone, Small Whets..₱ gro $24.00

Stove Polish—See Polish, Stove.

Stretchers, Carpet.

Cast Steel, Polished.....₱ doz $2.25
Cast Iron, Steel Points.....₱ doz 80¢
Socket.....₱ doz $1.75
Bullard's.....25@25&10%

Strops, Razor—

Genuine Emerson.....60@60&5%
Imitation " .....₱ doz $2.00, 20&10&5%
Torrey's.....20%
Badger's Belt and Com.....₱ doz $2.00
Lamont Combination.....₱ doz $4.00
Jordan's Pat. Padded, list Nov. 1,'89.50%
Electric.....List net

Stuffers or Fillers, Sausage—

Miles' "Challenge," ₱ doz $20, 50@50&5%
Perry.....₱ doz, No. 1, $15.00; No. 0, $21.00.....50&5@50&10%
Draw Cut No. 4, each $30.00.....20%
Enterprise Mfg. Co.....20&10@30%
Silver's.....40&10%

Sweepers, Carpet.

Bissell No. 5.....₱ doz $17.00
Bissell No. 7 New Drop Pan.₱ doz $19.00
Bissell, Grand.....₱ doz $36.00
Grand Rapids.....₱ doz $24.00
Crown Jewel, No. 1, $18.00; No. 2, $19.00; No. 3, $20.00
Magic.....₱ doz $15.00
Jewel.....₱ doz $17.00
Improved Parlor Queen,
Nickeled.....₱ doz $27.00
Japanned.....₱ doz $24.00
Excelsior.....₱ doz $22.00
Garland.....₱ doz $18.00
Parlor Queen.....₱ doz $24.00
Housewife's Delight.....₱ doz $15.00
Queen.....₱ doz $16.00
Queen, with band.....₱ doz $18.00
King.....₱ doz $30.00
Weed, Improved.....₱ doz $18.00
Hub.....₱ doz $16.00
Cog-Wheel.....₱ doz $16.00
Conqueror.....₱ doz $22.00
Easy.....₱ doz $22.00
Monarch.....₱ doz $22.00
Goshen.....₱ doz $21.00

Tacks, Brads, &c.—

List Oct. 19, 1889. Standard Weights.

Carpet Tacks—
American Iron, Blued.....77½%
Am'ican Iron, Tin'd or Cop'd.77½%
Steel, Plain or Bright.....75%
Steel, Tinned or Coppered.....75%
Swedes Iron, Blued.....75%
Swedes Iron, Tinned or Cop'd..75%
American Iron Cut Tacks.....75%
Swedes Ir. Uphol'rs' Tacks, Blued.75%
Swedes Iron Upholsterers' Tacks, Tinned.....77½%
Gimp and Lace Tacks, Blued.....75%
Gimp and Lace Tacks, Tinned..77½%
Swedes Iron Basket or Trimmers' Tacks.....70&10%
Miners' Tacks.....77½%
Bill-Posters' or Railroad Tacks..75%
Bill-Posters' or Railroad Tacks, Tinned.....77½%
Copper Tacks.....40%
Copper Finish. & Trunk Nails.....40%
Cigar Box Nails.....50%
Zinc Glaziers' Points.....50%
Picture-Frame Points.....50%
Looking-Glass Tacks.....50%
Brush Tacks.....60%
Tin-Capped Trunk Nails.....60%
Finishing Nails.....70%
Trunk and Clout Nails, Black and Tinned.....72½%
Common and Patent Brads.....70%
Hungarian Nails.....70%
Basket and Chair Nails.....65%
Leathered Carpet Tacks.....40%

Miscellaneous—

Double-Pointed, 120 count.....85&10%
Wire Carpet Nails.....50&10%
Plymouth Rock Steel Carpet Tacks..25%

Extra 10 @ 10&10 %

Wire Brads & Nails, see Nails, Wire.
Steel-Wire Brads, R. & E. Mfg. Co.'s list.....50&10%

Tapes, Measuring—

American.....40@40&5%
Spring.....40%
Chesterman's, Regular list.....25@30%

Thermometers—

Tin Case.....80@80&10%

Thimble Skeins—See Skeins.

Ties, Bale- Steel

Standard Wire, list.....50&10&5%

Tinners' Shears, &c.—See Shears, Tinners', &c.

Tinware—

Stamped, Japanned and Pieced, list Jan. 20 1887.....70&10@70&10&5%

Tire Benders, Upsetters, &c—
See Benders and Upsetters, Tire.

Tools.

Coopers'—

Bradley's.....30%
Barton's.....20@20&5%
L. & I. J. White.....20&5%
Albertson Mfg. Co.....25%
Beatty's.....30%
Sandusky Tool Co.....30@30&5%
Shaves, Cincinnati Tool Co.....30%

Lumber.

Ring Peavies, "Blue Line"...₩ doz $20.00
Ring Peavies, Common.....₩ doz $18.00
Steel Socket Peavies.....₩ doz $21.00
Mall. Iron Socket Peavies....₩ doz $19.00
Cant Hooks, "Blue Line"..₩ doz $16.00
Cant Hooks, Common Finish..₩ doz $14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish.....$16.00
Cant Hooks, Mall. Socket Common Finish.....₩ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish.....₩ doz $14.00
Cant Hooks, Clip Clasp, Common Finish.....₩ doz $12.00
Hand Spikes....₩ doz 6 ft., $15.00; 8 ft., $20.00
Pike Poles, Pike & Hook, ₩ doz., 12 ft., $11.50; 14 ft., $12.50; 16 ft., $14.50; 18 ft., $17.50; 20 ft., $21.50.
Pike Poles, Pike only, ₩ doz, 12 ft., $10.00; 14 ft., $11.00; 16 ft., $13.00; 18 ft., $16.00; 20 ft., $20.00.
Pike Poles, not ironed, ₩ doz, 12 ft. $6.00; 14 ft., $7.00; 16 ft., $9.00; 18 ft., $12.00; 20 ft., $16.00.
Setting Poles, ₩ doz, 12 ft., $14.00; 14 ft., $15.00; 16 ft., $17.00
Swamp Hooks.....₩ doz $18.00

Saw.

Atkins' Perfection.....₩ doz $12.00
Atkins' Excelsior.....₩ doz $6.00
Atkins' Giant.....₩ doz $4.00

Tobacco Cutters—See Cutters, Tobacco.

Transom Lifters — See Lifters, Transom.

Traps—

Game—

Newhouse.....40@40&5%
Oneida Pattern.....70&10%
Game, Blake's Patent.....40&10&5%

Mouse and Rat—

Mouse Wood, Choker, ₩ doz holes, 11@12¢
Mouse, Round Wire.....₩ doz $1.50, 10%
Mouse, Cage, Wire.....₩ doz $2.50, 10%
Mouse, Catch-'em-alive....₩ dz $2.50 15%
Mouse, Bonanza.....₩ doz $0.90@$1.00
Mouse, Delusion.....₩ $1.00@$1.25
Rat, Decoy.....₩ gr $10.00, 10%
Ideal.....₩ gr $10.00
Cyclone.....₩ gr $5.25
Hotchkiss Metallic Mouse, 5-hole traps, ₩ doz., 90¢; in full cases, ₩ doz.....75¢
Hotchkiss Imp. Rat Killer..₩ gro $18.50
Hotchkiss New Rat Killer...₩ gro $16.50
Schuyler's Rat Killer.....₩ gro $15.00

Triers—

Butter and cheese.....25%

Trimmers, Spoke.

Bonney's.....₩ doz $10.00, 50%
Stearns'.....20&10%
Ives', No. 1, $15.00; No. 2, $12.00 ₩ doz. 55&10%
Douglas'.....₩ doz $9.00, 20%
Cincinnati.....25%

Trowels—

Lothrop's Brick and Plastering, 20&10&5@35%
Reed's Brick and Plastering.....15%
Disston's Br'k and Plastering.....25%
Peace's Plastering.....25%
Clement & Maynard's.....20%
Rose's Brick.....15@20%
Brade's Brick.....25%
Worrall's Brick and Plastering.....20%
Garden.....70%

Trucks, Warehouse, &c.—

B. & L. Block Co.'s list, '82.....40%

Tubes, Boiler—
See Pipe.

Twine—

Flax Twine—	BC.	B.
No. 9, ¼ and ½ ℔ Balls	26¢	34¢
No. 12, ¼ and ½ ℔ Balls	25¢	33¢
No. 18, ¼ and ½ ℔ Balls	22¢	32¢
No. 24, ¼ and ½ ℔ Balls	22¢	32¢
No. 36, ¼ and ½ ℔ Balls	20¢	31¢

No. 264, Mattrass, ¼ and ½ ℔ Balls.52@54¢
Chalk Line, Cotton, ½ ℔ Balls.....25¢
Mason Line, Linen, ½ ℔ Balls.....55¢
2-Ply Hemp, ¼ and ½ ℔ Balls (Spring Twine).....15¼¢
3-Ply Hemp, 1 ℔ Balls.....16@16¾¢
3-Ply Hemp, 1¼ ℔ Balls.....15@15¼¢
Cotton Wrapping, 5 Balls to ℔ ..15@16¢
2, 3, 4 and 5-Ply Jute, ½ ℔ Balls.....10¢
Wool.....6¼@6¾¢
Paper.....13@14¢
Cotton Mops, 6, 9, 12 and 15 ℔ to doz..18¢

Vises—

Solid Box.....50&10@50&10&5%

Parallel—

Fisher & Norris Double Screw.....15&10%
Stephens'.....25@30%
Parker's.....20@25%
Wilson's.....55%
Howard's.....40%
Bonney's.....40&10%
Millers Falls.....40@40&10%
Trenton.....40&5@40&10%
Merrill's.....15@20%
Sargent's.....60&10&10%
Backus and Union.....40%
Double Screw Leg.....15&10%
Prentiss.....20@25%
Simpson's Adjustable.....40%
Moore's.....30%

Saw Filers—

Bonney's, Nos. 2 & 3, $15.00.....40&10%
Stearn's.....33⅓&10@33⅓&10&10%
Stearn's Silent Saw Vises.....33⅓@35%
Sargent's.....60%@10%
Hopkins'.....₩ doz $17.50, 10%
Reading.....40&10%
Wentworth.....20&10%

Miscellaneous.

Combination Hand Vises.....₩ gr $42.00
Cowell Hand Vises.....30%
Bauer's Pipe Vises.....10%
Cincinnati.....25&10%
Enterprise Pipe Vises, each.....$3.00

Wagon Boxes—See Boxes, Wagon.

Washer Cutters—See Cutters Washer.

Wagon Jacks—See Jacks, Wagon.

Ware, Hollow, Enameled, &c.

Cast Iron, Hollow—

Stove Hollow-Ware—
Ground.....55&5@60&5%
Unground.....65&10@65&10&5%
White Enameled-Ware—
Maslin Kettles.....60&10&5%
Boilers and Saucepans.....40%
Tinned Boilers and Saucepans.....40%
Rustless Hollow-Ware.....50@50&5%
Gray Enameled-Ware—
Stove.....50%
Maslin Kettles.....60&10&10%
Boilers and Saucepans.....40&5%

Enameled—

Agate and Granite Ware, list Jan. 1, 1889.....33⅓&10%
Ironclad Enameled Ware...dis 33⅓&10%

Kettles—

Galvanized Tea-Kettles—

Inch....	6	7	8	9
Each....	55¢	60¢	65¢	75¢

Standard Fiber—

	Per Dozen. Plain.	Dec'r'd
Wash-Basins, 10½ in.	$2.00	$2.25
Wash-Basins, 12 in.	2.25	2.75
Keelers, 11¼ in.		4.00
Cuspidors		3.00
Spittoons, "Daisy," 8 in.	4.00	4.50
Peck Measure	4.00	
Half-peck Measure	3.50	

See also Pails.

Indurated Fiber—25%

Spittoons, No. 2, ₩ doz.....$9.00
Basins, Ringed, ₩ doz., No. 2, $4.80; No. 3.....$4.20
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), ₩ nest.....$7.50
Keelers, Nested, Nos. 1, 2, 3 and 4 (4 pieces), ₩ nest.....$3.70
Butter Bowls 15, 17 and 19-inch (3 pieces), ₩ nest.....$2.25
Liquid Measures, pt., qt., 2 qt. and funnell (4 pieces) ₩ set.....$3.00
Dry Measures, 1, 2, 4, 8 and 16 qts. (5 pieces), ₩ set.....$3 00
See also *Pails.*

Silver Plated, Hollow—
4 mo. or 5 % cash in 30 days.

Reed & Barton, Meriden Britannia Co., Simpson, Hall, Miller & Co., Rogers & Brother..... 40&5%
Hartford Silver Plate Co, William Rogers Mfg. Co..... 40&5&5%

Washers—

Size	¼	5-16	⅜	½	⅝	¾	1
Washers	6¾	5½	4½	3½	3	3	3

In lots less than 200 ℔, ₩ ℔, add ¼¢, 5-℔ boxes 1¢ to list.

Wedges—

Iron.....₩ ℔ 3½¢
Steel.....₩ ℔ 4 ¢

Weights, Sash—

Solid Eyes.....₩ ton $18@$19

Well Buckets, Galvanized—See Buckets, Well, Galvanized.

Wheels, Well.

8 in., $2.25; 10 in., $2.70; 12 in., $3.25

Wire and Wire Goods—

Iron—

Market,
Br. & Ann., Nos. 0 to 18.....72½%
Cop'd, Nos. 0 to 18.....70%
Galv., Nos. 0 to 18.....62½%
Tin'd, Tinned list Nos. 0 to 18.....62½%
Stone,
Br. and Ann'd, Nos. 16 to 18.....72½%
Bright and Ann'd, Nos. 19 to 25.....75%
Br. and Ann'd, Nos. 27 to 36.....77½%
Tinned.....
Tinned Broom Wire, 18 to 21, ₩ ℔....5½¢
Galvanized Fence, Nos. 8 and 9.....65%
Annealed Fence, Nos. 8 and 9.....75%
Annealed Grape, Nos. 10 to 14.....75%
Brass, list Jan. 18, 1884.....25%
Copper, list Jan. 18, 1884.....35%
Bird Fence.....See Trade Report
Annealed Wire on Spools.....50%
Malin's Steel and Tin'd on Spools.....50%
Malin's Brass and Cop. on Spools.....40%
Cast Steel Wire.....50%
Stubs' Steel Wire.....$6.00 to $, 30%
Steel Music Wire, Nos. 12 to 30..65¢ ₩ ℔
Picture Wire.....New list 50%
Wire Clothes Lines, see Lines.

Bright Wire Goods—

Standard list.....85%

Wire Cloth and Netting.

Painted Screen Cloth, good quality, ₩ 100 sq. ft., $1.60 @ $1.75
Galvanized Wire Netting.....70&10@75%

Wire Rope—See Rope, Wire.

Wrenches—

American Adjustable.....40%
Baxter's Adjustable "S".....40&10@50%
Baxter's Diagonal.....40&10@50%
Coes' Genuine.....50&3%
Coes' "Mechanics'".....50&10&3%
Girard Standard.....65&10%
Lamson & Sessions' Engineers'..60&10%
Lamson & Sessions' Standard....70&10%
P. S. & W. Agricultural.....
Girard Agricultural.....
Lamson & Sessions' Agricl..} 75@75&10
Bemis & Call's
Pat. Combination.....35%
Merrick's Pattern.....35%
Brigg's Pattern.....25%
Cylinder or Gas Pipe.....10&5%
No. 3 Pipe.....40&10%
Aiken's Pocket (Bright).....$6.00, 50&10%
The Favorite Pocket.....₩ doz $4.00, 40%
Webster's Pat. Combination.....25%
Boardman's.....20&10%
Always Ready.....25&5%
Alligator.....50%
Donohue's Engineer.....20&10%
Acme, Bright.....50&2%
Acme, Nickeled.....40&2%
Walker's.....55&2%
Diamond Steel.....55&2%
Cincinnati Brace Wrenches.....25&10%
Tafts' Vise Wrench.....55&10&2%

Wringers, Clothes—

List March 11, 1889, 2% cash.

Wrought Goods—

Staples, Hooks, &c., list Jan. 12, 1888, 80&15@55%

PAINTS, OILS AND COLORS.—Wholesale Prices.

Animal and Vegetable Oils.

Linseed, City, raw..per gal.	62	@	64
Linseed, City, boiled.....	65	@	67
Linseed, Western, raw.....	..	@	60
Lard, City, Extra Winter..	53	@	54
Lard, City, Prime.....	50	@	51
Lard, City, Extra No. 1.....	45	@	46
Lard, City, No. 1.....	42	@	43
Lard, Western, prime.....	50	@	51
Cotton-seed, Crude, prime.	27	@	28
Cotton-seed, Crude, off grades.....	22	@	25
Cotton-seed, Summer Yellow, prime.....	34	@	35
Cottonseed, Summer Yellow, off grades.....	30	@	33
Sperm, Crude.....	..	@	71
Sperm, Natural Spring.....	70	@	72
Sperm, Bleached Spring....	75	@	77
Sperm, Natural Winter.....	76	@	78
Sperm, Bleached Winter...	81	@	83
Whale, Crude.....	..	@	..
Whale, Natural Winter.....	..	@	51
Whale, Bleached Winter....	..	@	53
Whale, Extra Bleached.....	56	@	..
Sea Elephant, Bleached Winter.....	60	@	62
Menhaden, Crude, Sound...	20	@	22
Menhaden, Crude, Southern	..	@	..
Menhaden, Light Pressed..	24	@	25
Menhaden, Bleached W'ter.	31	@	32
Menhaden, Extra Bleached	35	@	..
Tallow, City, prime.....	..	@	45
Tallow, Western, prime....	..	@	..
Cocoanut, Ceylon.....	..	@	7¾
Cocoanut, Cochin.....	..	@	8¼
Cod, Domestic.....	31	@	32
Cod, Foreign.....	33	@	34
Red Elaine.....	31	@	34
Red Saponified..... ₩ ℔	4¾@		5
Bank.....per gal	24	@	..
Straits.....	25	@	..
Olive, Italian, bbls.....	70	@	72
Neatsfoot, prime.....	62½@		75
Palm, prime, Lagos....₩ ℔	6¾@		7

Mineral Oils.

Black, 29 gravity, 25 @ 30 cold test.....per gal	8½@		9
Black, 29 gravity, 15 cold test.....	9	@	9½
Black, 29 gravity, summer.	7	@	8
Cylinder, light, filtered....	15	@	20
Cylinder, dark, filtered	14	@	20
Cylinder, dard, at'm refined	10	@	18
Paraffine, 23½ @ 24 gravity.	12½@		13
Paraffine, 25 gravity.....	11½@		12
Paraffine, 28 gravity.....	10½@		11
Paraffine, red, 21 @ 22 gr'ty	@		14¼
Paraffine, red, 23½@23 gr'ty	12¼@		13

Paints and Colors.

Barytes, Prime White..... ₩ ton.	$21.00	@	$22.50
Barytes, Amer. refined...20.00		@	....
Barytes, Amer. No. 1....18.00		@	....
Barytes, Amer. No. 2....16.00		@	....
Barytes, Amer., off-color.13.00		@	15.00
Blue, Celestial..... ₩ ℔	6	@	8
Blue, Chinese	50	@	55
Blue, Prussian.....	25	@	40
Blue, Ultramarine	10	@	30
Brown, Spanish	⅛@		1
Brown, Vandyke, Amer..	3	@	3½
Brown, Vandyke, English	6	@	8
Black, American Drop....	8	@	10
Black, English Drop.....	12	@	14
Black, Frankfort, Drop....	5	@	18
Black, Lamp, common...	12	@	18
Black, Lamp, medium....	19	@	25
Black, Lamp, prime.....	27	@	33
Carmine, No. 40, in bulk. 3.10		@	..
Carmine, No. 40, in boxes or barrels	3.20	@	..
Carmine, No. 40, in ounce bottles.....	4.20	@	..
Chalk, in bulk.... ₩ ton.	2.50	@	..
Chalk, in bbls..₩ 100 ℔.	.30	@	35
China Clay, English..... ₩ ton.	13.50	@	18.00
China Clay, Southern....10.00		@	12.00
Cobalt Oxide, prep'd....	2.90	@	....
Cobalt Oxide, black.. lots 100 ℔.	2.60	@	....
Cobalt, Oxide, black..... less 100 ℔	2.65	@	....
Crocus Martus, Engl. ₩ ℔.	1½@		2½
Crocus, American	1½@		2½
Green, Paris, in bulk....	14	@	14½
Green, Paris, 170 @ 175 ℔ kegs.....	14½@		15
Green, Paris, small pack.	16	@	21
Green, Chrome, ordinary	8	@	13
Green, Chrome, pure....	22	@	25
Lead, Eng., B.B. white....	9	@	10
Lead, Amn. White, dry or in oil: Kegs, lots less than 1000 ℔..		@	7¾
Kegs, lots 1000 ℔ to 5 tons.		@	7¼
Kegs, lots 5 tons to 12 tons..		@	7⅛
Kegs, lots 12 tons and over..		@	7
Lead, White, in oil, 25 ℔ tin pails, add to keg price.		@	⅛
Lead, White, in oil, 12½ ℔ tin pails, add to keg price.....		@	1
Lead, White, in oil, 1 to 5 ℔ assorted tins, add to keg price.		@	2½
Lead, Red, bbls. and ½ bbls....	6¾	@	7½
Lead, Red, kegs.....	7	@	7¾
Litharge, kegs.....	7	@	7¾
Litharge, bbls. and ½ bbls.....	6¾	@	7½

TERMS, &c.—Lead and Litharge.—On lots of 1000 ℔ or over, 60 days' time or 2½ % discount for cash if paid within 15 days of date of invoice.

Ocher, Rochelle.....	1.35	@	1½
Ocher, French Washed....	1½@		2½
Ocher, German Washed...	1½@		3
Ocher, American.....	½@		1½
Orange Mineral, English....	9	@	9½
Orange Mineral, French....	9½@		10
Orange Mineral, German...	8½@		9½
Orange Mineral, American..	8	@	8½
Paris White, English Cliffstone.....	90	@	1.10
Paris White, American.....	70	@	80
Red, Indian, English.....	5½@		7
Red, Indian, American....	2	@	6
Red, Turkey.....	9	@	14
Red, Tuscan	9	@	11
Red, Venetian, American.. ₩ 100 ℔.	1.00	@	1.35
Red, Venetian, English....	1.25	@	1.75
Sienna, Italian, Burnt and Powd. ₩ ℔	5	@	6½
Sienna, Ital., Burnt Lumps	1½@		3½
Sienna, Ital., Raw, Powd..	5	@	6½
Sienna, Ital., Raw Lumps..	2	@	3½
Sienna, American, Raw....	1½@		1¾
Sienna, American, Burnt and Powdered.....	1½@		1¾
Talc, French.....	1½@		1½
Talc, American.....	1	@	1½
Terra Alba, Fr'ch. ₩ 100 ℔	72½@		80
Terra Alba, English	80	@	85
Terra Alba, American No.1	70	@	75
Terra Alba, American No.2	38	@	40
Umber, Turkey, Bnt. and Powd..... ₩ ℔	3½@		4
Umber, Turkey Bnt. Ln	2½@		3
Umber, Turkey, Raw and Powdered.....	3½@		
Umber, Turkey, R'w Lmps	2½@		2¾
Umber, Turkey, Bnt. Amer.	1½@		1¾
Umber, Turkey, R'w Amer.	1¼@		1¾
Yellow, Chrome.....	10	@	25
Vermilion, Americ. Lead..	11½@		13
Vermilion, Quicks'er, bulk.	..	@	77½
Vermilion, Quicks'er, bags.	..	@	78½
Vermilion, Quicksilver, smaller pkgs.....	..	@	82½
Vermilion, English Import	85	@	87½
Vermilion, Imitation, Eng.	8	@	25
Vermilion, Trieste.....	87½@		90
Vermilion, Chinese.....	90	@	95
Whiting, Common. ₩ 100 ℔	40	@	45
Whiting, Gilders'.....	50	@	55
Zinc, American, dry.... ₩ ℔	4½@		5½
Zinc, French, Red Seal.....	..	@	8½
Zinc, French, Green Seal..	..	@	8½
Zinc, French, V. M. X.....	..	@	7
Zinc, Antwerp, Red Seal...	..	@	7½
Zinc, Antwerp, Green Seal	..	@	8½
Zinc, German, L. Z. O....	..	@	6¾
Zinc, V. M. in Poppy Oil, G. Seal, lots of 1 ton and over.....	10¾@		11¼
lots less than 1 ton.....	11	@	11¾
Zinc, V. M. in Poppy Oil, Red Seal.....	..	@	..
lots of 1 ton and over.....	10	@	10¼
Lots of less than 1 ton....	10¼@		10¾

DISCOUNTS.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1 %; 25 bbls, 2 %, 50 bbls, 4 %. No discount allowed on less than bbl. lots.

Colors in Oil.

Blue, Chinese.....₩ ℔	35	@	40
Blue, Prussian.....	20	@	45
Blue, Ultramarine.....	12	@	18
Brown, Vandyke.....	7	@	12
Green, Chrome.....	8	@	13
Green, Paris.....	16	@	18½
Sienna, Raw.....	7	@	13
Sienna, Burnt.....	7	@	13
Umber Raw.....	7	@	10
Umber, Burnt	7	@	10

Glue.

Low Grade.....₩ ℔	8	@	10
Cabinet.....	12	@	14
Medium White.....	13	@	15
Extra White.....	17	@	20
French.....	10	@	2
English.....	10	@	15
Irish.....	12	@	15

CURRENT METAL PRICES.

NOVEMBER 5 1890.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.

Bar Iron from Store.

Common Iron: ⅜ to 2 in. round and square.. 1 to 6 in. x ⅜ to 1 in.....	₩ ℔ 2.00 @ 2.10¢
Refined Iron: ⅜ to 2 in. round and square.. 1 to 4 in. x ⅜ to 1½ in..... 4½ to 6 in. x ⅜ to 1 in.....	₩ ℔ 2.10 @ 2.30¢
1 to 6 in. x ¼ and 5-16	₩ ℔ 2.30 @ 2.50¢
Rods—⅜ and 11-16 round and sq.	₩ ℔ 2.20 @ 2.40¢
Bands—1 to 6 x 3-16 to No. 12	₩ ℔ 2.40 @ 2.60¢
"Burden Best" Iron, base price	₩ ℔ 3.00¢
Burden's "H. B. & S." Iron, base price	₩ ℔ 2 8½¢
"Ulster"	₩ ℔ 3.00¢
Norway Bars	4.00¢
Norway Shapes	5.00¢

Merchant Steel from Store.

	Per pound.
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots	2½¢
Best Cast Steel, base price in small lots	8 ¢
Best Cast Steel Machinery, base price in small lots	5¢

Sheet Iron from Store.

	Common American.	R. G.	Cleaned.
19 to 16	₩ ℔ 3.00 @ 3.00¢	3.50 @	¢
17 to 20	₩ ℔ 3.25 @ 3.25¢	3.50 @ 3.75	¢
21 to 24	₩ ℔ 3.35 @ 3.35¢	3.75 @	¢
25 and 26	₩ ℔ 3.45 @	3.75 @	¢
27	₩ ℔ 3.55 @ 3.62½¢	4.00 @	¢
28	₩ ℔ 3.75 @	4.25 @	¢
	B. B.		2d qual.
Galv'd, 14 to 20,	₩ ℔, 5.00 @	4.75½ @	¢
Galv'd, 21 to 24,	₩ ℔, 5.37½ @	5.12½ @	¢
Galv'd, 25 to 26,	₩ ℔, 5.75 @	5.50 @	¢
Galv'd, 27	₩ ℔, 6.12½ @	5.85½ @	¢
Galv'd, 28	₩ ℔, 6.50 @	6.23 @	¢
Patent Planished	₩ ℔ A 10¢		B, 9¢
Russia	₩ ℔ 9½¢ @ 10¢		
American Cold Rolled B. B.	₩ ℔ 5¢ @ 7¢		
Craig Polished Sheet Steel	₩ ℔, 8½¢		

English Steel from Store.

Best Cast	₩ ℔ 15 ¢
Extra Cast	₩ ℔ 16½ @ 17 ¢
Swaged, Cast	₩ ℔ 16 ¢
Best Double Shear	₩ ℔ 15 ¢
Blister, 1st quality	₩ ℔ 12 ¢
German Steel, Best	₩ ℔ 10 ¢
2d quality	₩ ℔ 9 ¢
3d quality	₩ ℔ 8 ¢
Sheet Cast Steel, 1st quality	₩ ℔ 15 ¢
2d quality	₩ ℔ 14 ¢
3d quality	₩ ℔ 12½¢
R. Mushet's "Special"	₩ ℔ 48 ¢
" " "Titanic"	₩ ℔ 20 ¢

METALS.

Tin.

	Per ℔
Banca, Pigs	23 ¢
Straits, Pigs	22½¢
Straits in Bars	26 ¢

Tin Plates.

	Charcoal Plates.—Bright.		Per box.
Melyn Grade	IC, 10 x 14	@	$6.50
" "	IC, 12 x 12	@	6.75
" "	IC, 14 x 20	@	6.50
" "	IC, 20 x 28	@	13.25
" "	IX, 10 x 14	@	8.00
" "	IX, 12 x 12	@	8.25
" "	IX, 14 x 20	@	8.00
" "	IX, 20 x 28	@	16.00
" "	DC, 12½ x 17	@	6 00
" "	DX, 12½ x 17	@	7.50
Calland Grade	IC, 10 x 14	@	6.50
" "	IC, 12 x 12	@	6.75
" "	IC, 14 x 20	@	6.40
" "	IX, 10 x 14	@	7.65
" "	IX, 12 x 12	@	7.90
" "	IX 14 x 20	@	7.65
Allaway Grade	IC, 10 x 14	@	6.00
" "	IC, 12 x 12	@	6.15
" "	IC, 14 x 20	@	6.00
" "	IC, 20 x 28	@	11.80
" "	IX, 10 x 14	@	7.17
" "	IX, 12 x 12	@	7.30
" "	IX, 14 x 20	@	7.15
" "	IX, 20 x 28	@	14.25
" "	DC, 12½ x 17	@	5.65
" "	DX, 12½ x 17 6.00	@	6.65

Coke Plates.—Bright.

Steel Coke.	IC, 10 x 14, 14 x 20	@	$5.60
	10 x 20	@	7.75
	20 x 28	@	11.25
	IX, 10 x 14, 14 x 20	@	6.50
BV Grade.	IC, 10 x 14, 14 x 20	@	5.60

Charcoal Plates.—Terne.

Dean Grade.	IC, 14 x 20	@	$5.40
	20 x 28	@	10.70
	IX, 14 x 20	@	6.10
	20 x 28	@	12.10
Abecarne Grade.	IC, 14 x 20	@	5.10
	20 x 28	@	10.35
	IX, 14 x 20	@	6.10
	20 x 28	@	12 10

Tin Boiler Plates.

I CX, 14 x 28	112 sheets	@	$13.50
I CX, 14 x 28	112 sheets	@	13.75
I CX, 14 x 31	112 sheets	@	15 25

Copper.

Duty: Pig, Bar and Ingot, 1½¢; Old Copper, 1¢ ₩ ℔. Manufactured (including all articles of which Copper is a component of chief value), 35% ad valorem.

Ingot.

Lake	@	17½¢
Baltimore Grade	@	15½¢

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, June 27, 1890, being quotations for all sized lots.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound. Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30	72		25	25	25	26	27	28	31	33
30	72		25	25	25	26	28	30	34	....
36	96		25	25	25	27	29	33	36	....
36	96		25	25	26	28	30	34	38	....
48	96		25	25	27	29	31	35	....	....
48	96		25	25	28	30	32	36	....	....
60	96		25	25	30	32	37	....	....	....
60	96		25	26	31	....	....	....	....	....
84	96		26	27	....	....	....	....	....	....
84	96		27	28	....	....	....	....	....	....
Over 84 in. wide			28	30	....	....	....	....	....	....

All Bath Tub Sheets	16 oz.	14 oz.	12 oz.	10 oz.
Per pound	$0.27	0.29	0.31	0.35

Bolt Copper, ⅝ inch diameter and over, per pound 35¢

Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Copper Bottoms, Pits and Flats.

	Per pound.
14 ounce to square foot and heavier	29¢
12 ounce and up to 14 ounce to square foot	30¢
10 ounce and up to 12 ounce	32¢

Circles less than 8 inches diameter 2 cents per pound additional.

Circles over 13 inches diameter are not classed as Copper Bottoms.

Tinning.

Tinning sheets on one side, 10, 12 and 14 x 48 each	8¢
Tinning sheets on one side, 30 x 60 each	30¢
For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each	15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each	12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.) each	12¢
Tinning sheets on one side, other sizes, per square foot	2½¢

For tinning both sides double the above prices.

Planished Brass and Copper.

14 x 48.

14 and 16 oz. and heavier..31¢. By the case...30¢ ₩ ℔
12 oz. and lighter.....33¢. By the case...32¢ ₩ ℔

24 x 48 and 30 x 60.

14 and 16 oz. and heavier..44¢. 12 oz.....37¢ ₩ ℔

Seamless Brass and Copper Tubes.

O. G.	N. G.	⅜	½	⅝	¾	⅞	1	1¼
8-14	6-12	39	35	32	31	30	29	26
15	13	40	35	33	32	31	30	27
16	14	41	36	34	33	32	31	27
17	15	42	37	35	33	33	32	28
18	16	44	38	36	34	33	32	29
19	17	45	39	37	36	35	34	31
20	18-19	46	41	39	38	37	36	33
21	20	48	43	41	40	39	38	36
22	21	50	44	42	41	40	39	38
23	22	52	46	44	43	42	41	41
24	23	55	48	46	45	43	42	43
25	24	58	51	48	47	46	45	47

Copper Bronze and Gilding Tube, 4¢ ₩ ℔ additional.

Brazed Brass Tubing. (To No. 20, inclusive.

Above 5-16 inch to 3 inch, inclusive	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	1.50
Fancy Tubing, Brass, to No. 20, inclusive	43¢ ₩ ℔
Bronze Tubing, 3¢ ₩ ℔ more than Brass.	
Discount from list	25 @ ... %

Roll and Sheet Brass.

Discount from list 30 %

High Brass Rods.

Over 1 inch diameter	20¢
¼ inch to 1 inch diameter, both inclusive	26¢
No. 8 and less than ¼ inch diameter	28¢
Smaller than No. 8	32¢

Hexagon, Octagon and Square, 2¢ ₩ ℔ advance over Round Rods.

Spelter.

Duty: Pig, Bars and Plates, $1.50 ₩ 100 ℔.

Western Spelter	6½ @ 6¾¢
"Bertha"	8¼¢

Zinc.

Duty; Sheet, 2½¢ ₩ ℔.

600 ℔ casks	7¼¢
Per ℔	7¾¢

Lead.

Duty: Pig, $2 ₩ 100 ℔. Old Lead, 2¢ ₩ ℔. Pipe and Sheets, 2½¢ ₩ ℔.

American	5½¢ @ 5¾¢
Bar	6½¢
Pipe, subject to trade discount	8¢
Tin-Lined Pipe, subject to trade discount	15¢
Block Tin Pipes, subject to trade discount	45¢
Sheet, subject to trade discount	8¾¢

Solder.

½ @ ½ (Guaranteed)	16½¢
No. 1	13¢
Extra Wiping	11½¢ @ 13¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson	₩ ℔ 22 ¢
Hallett's	" 21 ¢

ALUMINUM.

Prices in Ingots.

$2.00 ₩ ℔ in lots of 1000 ℔ and over.
$2.25 ₩ ℔ in lots of 500 ℔ and over.
$2.50 ₩ ℔ in lots of 100 ℔ and over.

Prices Per Pound on Rolled Sheets.

(Brown & Sharpe, Standard Gauge.)

Wider than. And including.	2 in. 10 in.	10 in. 14 in.	14 in. 18 in.	18 in. 22 in.	22 in. 24 in.
Up to No. 20 inclusive	$2.50	$2.60	$2.80	$3.00	$3.20
Nos. 21, 22, 23 and 24	2.60	2.70	2.90	3.10	3.30
Nos. 25 and 26	2.70	2.80	3.00	3.20	3.40
Nos. 27 and 28	2.80	2.90	3.10	3.30	3.50

Sheets, thinner than No. 28 gauge and wider than 24 inches, special prices not less than $5 per pound.
Add 35 cents per pound for sheets cut to particular widths and lengths.
Sheets rolled to .001 in. and under, 50 cents per ounce.
Leaf in books, 20 cents per book; $2 per pack of 10 books, sheets 5 x 5 inches.

Aluminum Tubing.

From $4 per pound upward, according to size and thickness of walls.

Aluminum Castings.

From 50 cents upwards per pound extra over the cost of the metal in ingots, according to the number wanted, weight, the difficulty of casting, cost of patterns, &c.

Aluminum Wire in Coils.

(Brown & Sharpe, Standard Gauge.)

	Per ℔
All numbers up to No. 24 (.064 in.) inclusive	$3.00
Nos. 15 (.05706 in.) to 22 (.0254 in.) inclusive	3.25
Nos. 23 (.02571 in.) and 24 (.0201 in.) inclusive	3.50
Nos. 25 (.0179 in.) and 26 (.01594 in.) inclusive	3.75
Nos. 27 (.014195 in.) and 28 (.012641 in.) inclusive	4.00
Nos. 29 (.011257 in.) and 30 (.010023 in.) inclusive	4.25
No. 31 (.008928 in.)	4.50
No. 32 (.00795 in.)	4.75
No. 33 (.00708 in.)	5.00
No. 34 (.00630 in.)	5.25
No. 35 (.00561 in.)	5.75
No. 36 (.00500 in.)	6.25
No. 37 (.00445 in.)	7.00
No. 38 (.003965 in.)	8.50
No. 39 (.003531 in.)	12.00
No. 40 (.003144 in.)	16.00

Spooling, on 1-pound spools, 15 cents per pound extra
Spooling, on 10-pound spools, 5 cents per pound extra

Old Metals.

(Prices Paid in New York.)

Heavy Copper	₩ ℔	12 ¢
Light Copper	₩ ℔	11 ¢
Heavy Brass	₩ ℔	10 ¢
Light Brass	₩ ℔	8 ¢
Lead	₩ ℔	4 ¢
Tea Lead	₩ ℔	3½¢
Zinc	₩ ℔	3 ¢
No. 1 Pewter	₩ ℔	16 ¢
No. 2 Pewter	₩ ℔	8 ¢
Wrought Scrap Iron	₩ gross ton	$19.00
Heavy Cast Scrap	₩ gross ton	12.00
Stove Plate Scrap	₩ gross ton	8.00
Burnt Iron	₩ gross ton	6.00